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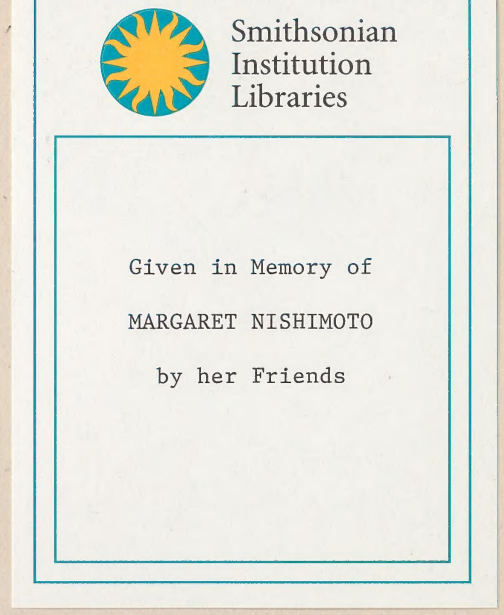
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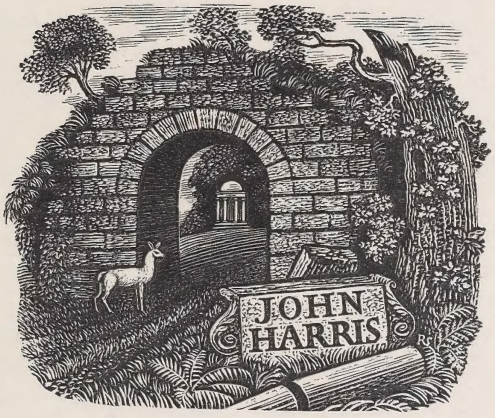
JOHN
HARRIS

A

TREATISE

ON

FORMING, IMPROVING, AND MANAGING

COUNTRY RESIDENCES;

AND ON THE

CHOICE OF SITUATIONS APPROPRIATE TO EVERY CLASS OF PURCHASERS.

IN ALL WHICH THE OBJECT IN VIEW IS TO UNITE IN A BETTER MANNER THAN HAS HITHERTO BEEN DONE,

A TASTE FOUNDED IN NATURE WITH ECONOMY AND UTILITY,

IN CONSTRUCTING OR IMPROVING

MANSIONS, AND OTHER RURAL BUILDINGS,

SO AS TO COMBINE ARCHITECTURAL FITNESS WITH PICTURESQUE EFFECT;

AND IN

FORMING GARDENS, ORCHARDS, FARMS, PARKS, PLEASURE-GROUNDS, SHRUBBERIES, ALL KINDS OF USEFUL OR DECORATIVE PLANTATIONS, AND EVERY OBJECT OF CONVENIENCE OR BEAUTY PECULIAR TO COUNTRY SEATS;

ACCORDING TO THE EXTENT, CHARACTER, OR STYLE OF SITUATIONS,

AND THE RANK, FORTUNE, AND EXPENDITURE OF PROPRIETORS;

FROM THE COTTAGE TO THE PALACE.

WITH

AN APPENDIX,

CONTAINING AN ENQUIRY INTO THE UTILITY AND MERITS OF MR. REPTON'S MODE OF SHEWING EFFECTS BY *SLIDES* AND SKETCHES, AND STRICTURES ON HIS OPINIONS AND PRACTICE IN LANDSCAPE GARDENING.

ILLUSTRATED BY DESCRIPTIONS OF SCENERY AND BUILDINGS,

BY REFERENCES TO COUNTRY SEATS, AND PASSAGES OF COUNTRY IN MOST PARTS OF GREAT BRITAIN,

AND BY THIRTY-TWO ENGRAVINGS.

By JOHN LOUDON, ESQ. F.L.S.

MEMBER OF THE SOCIETY OF ARTS, COMMERCE, &c. LONDON, OF THE SOCIETY OF AGRICULTURE, PLANTING, &c. BATH; AUTHOR OF A TREATISE ON HOT-HOUSES, AND OBSERVATIONS ON LANDSCAPE GARDENING, &c.

IN TWO VOLUMES.——VOL. I.

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1806.

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CHMRB

TO THE

NOBLEMEN, LADIES, AND GENTLEMEN,

WHOSE RESIDENCES

ARE REFERRED TO IN THE FOLLOWING

WORK,

IT IS RESPECTFULLY INSCRIBED

BY THEIR DEVOTED SERVANT,

THE AUTHOR.

90, *Newman Street,*
1*st Oct.* 1806.

PREFACE.

THOUGH a work of this nature has hitherto been a desideratum in rural economics, it was by no means that circumstance which induced the author to compose the following Treatise. The subject, from his earliest years, has been his favourite study and amusement; he has considered every branch of it practically and theoretically—minutely and generally; and he is now engaged in it in a professional capacity. He is convinced that the principles of the theory from which he acts lead to effects much preferable to the results of general practice; and that this theory is sufficient to establish an art (which has hitherto been guided chiefly by fashion or caprice) upon principles inherent in the nature of man. Conceiving that a detail of these principles, and the practices which flow from them, if disseminated in a book might tend materially to their general introduction, he has thence been led to consider the subject in that extensive manner which gave rise to the title page of this volume.

The reader will not imagine, from this, that every elementary branch of the art of forming a residence is treated as minutely as they would be in separate treatises. Such a plan would have been mere book-making, and must have contained so much of what has already been repeated by other writers, as to have rendered it displeasing to all readers of taste : to those of inquiry the drudgery of selecting the particular views of the author among such a mass of common-place matter, would have been so great as in all probability to have precluded the task. The whole is but a short transcript of the leading ideas and general principles which are prominent in the author's mind on the subject of his profession. The reasoning and the practices recommended are just those which he is in the daily habit of applying to real scenery. Without implying any disrespect for the opinion of others, he has shewn no anxiety either to coincide or differ with them, farther than as these opinions have been put in practice.

It may be necessary here to make an apology to the proprietors of those residences which I have occasionally so freely criticised. Let it be considered, that no natural or unavoidable deformities are ever objected to ; but merely such as are considered to be the result of bad taste, and such, of course, as can be removed or improved upon, should the remarks that I have made be *felt* to have any weight. Neither are these

residences ever referred to as the only examples of faults or beauties; but merely as those which more immediately occurred to the author at the time of writing.

Both kinds of references became necessary, not only as illustrations of my principles, but as tests of their truth and practicability. And I may add, that in some instances it is done to silence and set at defiance a certain class of men, who are ever ready in theory to coincide with such principles as may be deemed new or excellent; while by their practice they shew that they neither understand nor feel the force of such principles.

I may remark here, that where I use the word improver in the following pages, I as commonly allude to such as direct the operations upon their own grounds as to professors. When I use the term Designer, or Landscape Gardener, I of course allude to Professors. If when speaking of them, generally, I have occasionally used strong language, it must be attributed to two causes; in the first place, to the general obstinacy and dogmatical manner in which Mr. Brown's disciples, and those who may be called geometrical architects*, give

* I mean those who never consider picturesque effect, and the harmony of the building with the situation, but do every thing by geometrical elevations, without any reference to surrounding scenery.

their plans and opinions, without being able to reconcile what they propose with *common sense*, or ever condescending to alter or improve them agreeably to the natural taste of their employers; and, in the second place, to a firm conviction of their truth, and a strong feeling of their importance. It would have been easy to have softened them off by palliatives, or even to have used weak expressions; but I have in every instance found, that writers who have adopted this practice were actuated, not by real diffidence or modesty, but by a conscious deficiency of knowledge—weakness of intellect—or, an undecided opinion with regard to the subject. Good taste and nature are the same, and their impressions being congenial to unprejudiced minds, are decisive, clear, and permanent. Language is the offspring of impressions. Not a single remark, however, will be found, either on art or its professors, but what is perfectly in unison with that candour and politeness, which, if wanting, would display such a bad taste as might justly induce the reader to doubt my judgment in every thing else.

A number of the plates in this volume are mere geometrical elevations, plans, or sections, and therefore are chiefly to be considered in connection with the text. The others are alike illustrative; but being views of the same scenes under two dif-

ferent styles of improvement, they also serve, by a mere inspection of them, to characterize the nature of that part of the improvements proposed which regard picturesque effect. Such are Plates VII. VIII. XIV. XV. XVI. XXIII. with their contrasts, and also the other plates placed together at the end of Vol. II. All these, except Plates VII. and VIII. are taken from nature; and though it would be next to ridiculous to say, that every particular must be done exactly as shewn in them, yet the general style of the alterations can never be mistaken for that of modern gardening. In opposing these improved views to those of the scene in its previous state, it would have been easy to have rendered the beauties of the one and the defects of the other much more striking, by finishing the one engraving more than the other. But this I have uniformly avoided, as a trick unworthy of science. Neither have I ever used slides in Mr. Repton's manner, to which I have the same objections*. But I wish it particularly to be remarked, that I have not in any case given a fictitious age and form to the trees in these drawings, as is commonly done. In them, as in every part of the work, a rigid adherence to truth is observed.

I now submit this work to the reader, with that confidence which arises from a strong experimental conviction, that the

* See Appendix, No. I.

leading principles assumed, and the practices recommended, are founded in good taste and utility; but, at the same time, with that deference to public opinion, which humility requires, and that openness to correction and advice which a sense of human imperfection renders necessary, and which good taste naturally dictates.

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LIST OF

COUNTRY RESIDENCES

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Abercairnie	Colonel Murray	Perthshire.
Adlestrop	J. H. Leigh, Esq.	Gloucestershire.
Airthrie	Sir Robert Abercrombie, K. B.	Stirlingshire.
Airth	William Graham, Esq.	Stirlingshire.
Aimsfield	The Right Hon. the Earl of Wemyss	Haddingtonshire.
Allerton Hall	William Roscoe, Esq.	Lancashire.
Althorpe Park	The Right Hon. Earl Spencer	Northamptonshire.
Alnwick Castle	His Grace the Duke of Northumberland	Northumberland.
Archerfield	J. K. Nisbet, Esq.	Haddingtonshire.
Barnbarrow	Robert Vans Agnew, Esq.	Wigtonshire.
Baldoon	The Right Hon. the Earl of Galloway	Wigtonshire.
Barnton	William Ramsay, Esq.	Edinburghshire.
Barnbugle	The Right Hon. the Earl of Roseberry	Linlithgowshire.
Barganny	Sir Hew Hamilton Dalrymple, Bart.	Ayrshire.
Bellevue	City of Edinburgh	Edinburghshire.
Beanston	The Right Hon. Lord Elcho	Haddingtonshire.
Belmont	Mrs. Walker	Edinburghshire.
Beaumont Abbey	Colonel Beaumont	Northumberland.
Belvoir Castle	His Grace the Duke of Rutland	Lincolnshire.
Beaudesart	The Right Hon. the Earl of Uxbridge	Staffordshire.
Beverley Park	Sir R. M. Wilmot, Bart.	Kent.
Bevelaw	John Johnson, Esq.	Edinburghshire.
Birchhill	James Gillespie, Esq.	Fifeshire.

LIST OF COUNTRY RESIDENCES.

Blenheim ..... His Grace the Duke of Marlborough ..... Oxfordshire.
Blair-drummond ..... William Drummond, Esq. ..... Stirlingshire.
Blaize Castle ..... T. Harford, Esq. ..... Gloucestershire.
Bolton Abbey ..... His Grace the Duke of Devonshire ..... Yorkshire.
Bothwell ..... The Right Hon. Lord Douglass ..... Lanarkshire.
Braid House ..... ——— Gordon, Esq. ..... Edinburghshire.
Bramham Park ..... W. Fox Lane, Esq. ..... Yorkshire.
Braham Castle ..... The Right Hon. Lord Seaforth ..... Bamfshire.
Burleigh ..... The Right Hon. the Earl of Winchelsea ..... Rutlandshire.

Caernarvon Castle ..... The Right Hon. the Earl of Caernarvon ..... Caernarvonshire.
Castle Howard ..... The Right Hon. the Earl of Carlisle ..... Yorkshire.
Captainhead ..... William Sherrief, Esq. ..... Edinburghshire.
Castlewigg ..... John Hawthorn, Esq. ..... Wigtonshire.
Callander ..... ——— Forbes, Esq. ..... Stirlingshire.
Carphin ..... James Stewart, Esq. ..... Lanarkshire.
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Ditchley House ..... The Right Hon. Lord Dillon ..... Oxfordshire.
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Kingswood Lodge .....Gideon Bikerdyke, Esq. .....Surrey.
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Lesbury .....William Hay, Esq..... .....Northumberland.
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Loudon Castle .....The Rt. Hon. Countess of Loudon &Moira ...Ayrshire.
Luton Park .....The Most Noble the Marquis of Bute ..... .Hertfordshire.

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Rosyth Castle.....The Crown ....Fifeshire.
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Scone.....Ditto..... ....Perthshire.
Shardeloes .....T. D. T. Drake, Esq.....Buckinghamshire.
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Woolaton ..... .The Right Hon. Lord Middleton .....Nottinghamshire.
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THE

THEORY AND PRACTICE

OF FORMING A

COUNTRY RESIDENCE.

INTRODUCTION.

RURAL scenery is so congenial to the human mind, that there are few persons who do not indulge the hope of retiring at some period into the country. Its peculiar and gentle pleasures are suited to all ages and every rank of life, and afford not less gratification to the general observer, than to the philosopher, the poet, or the painter. Works of art generally require from their votaries time, thought, and a particular study, in order to become acquainted with their beauties: but we have only to see nature, to love and admire her. Every one feels himself touched by her effects,—enlivened by scenes of verdure, freshness, and fragrance,—aroused by the roar of the cataract,—or soothed almost to repose by the setting sun gilding the western skies, and illuminating the tops of the distant mountains. Who has not felt the varied effect of the seasons, or even the no less amazing variety of a single day? Who does not feel himself animated by the rising splen-

dour of the morning? Who has not felt the heat and excess of noon, the serenity and magnificence of evening, and the solemnity and grandeur of night? If there be any one whose frozen soul has never felt the energy of such scenes, to him it is in vain to recommend them; to others no recommendation is wanting.

Those who enjoy a country residence have an opportunity of adding to the charms of rural scenery, the pleasures resulting from agriculture and gardening. These recreations are almost equally congenial with the human mind; and the pleasure that attends their pursuit is still farther recommended by their utility in life and their influence on society. The cultivation of a garden was the first employment given to man; and agriculture and planting have been pursued by some of the greatest men in every age; many of whom have left ample testimonies of the satisfaction which they derived from practising those arts. "God Almighty first planted a garden," says Lord Bacon; "and indeed it is the purest of human pleasures. It is the greatest refreshment to the spirits of man; without which, buildings and palaces are but gross handyworks."

Such is the superiority of rural occupations and pleasures, that commerce, large societies, or crowded cities, may be

justly reckoned unnatural. Indeed, the very purpose for which we engage in commerce is, that we may one day be enabled to retire to the country, where alone we picture to ourselves days of solid satisfaction and undisturbed happiness. It is evident that such sentiments are natural to the human mind. All men, even though born in cities, possess the same ideas, which, if they be not erased by poverty and disease, haunt them through the whole journey of life. Perhaps it is in this sphere only that man may approach the simplicity of nature, and attain the enjoyments and pleasures of pristine innocence.

But laying aside these considerations, which may be slighted or misconceived, let me add a motive more common, and likely to be more generally attractive; I mean the *ease*, *liberty*, and *independence* of a country residence. Large cities, from their very nature, are scenes of continual activity. There every individual must fill up with vigour and constancy the place which he occupies in society; he must often forego his own pleasures, in order to accommodate himself to the interests, wishes, humour, or caprices of those with whom he is connected. He must enter into their business and amusements; speak and think in a certain degree upon the same topics; dress, and even perform many of the animal functions, in the fashion of his neighbours, or he will be despised, and discarded from society. But even though he conform as much

as possible to the ruling fashion of the day, he is still liable, whilst among such numbers, to incur displeasure.

In the country, however, it is otherwise: there, a gentleman may live with his family upon his own estate, free from the intrusion, bustle, and discord, which prevail in public cities. In place of the risk and uncertainties of commerce, he enjoys the less fleeting products of the soil. His hours are devoted to the pleasure of cultivating his fields, gardens, and plantations, and in promoting the happiness and prosperity of an industrious peasantry. In this way he enjoys the society of his own amiable family:—his improvements give bread and comfort to the poor; while he selects his particular friends, and renders all around him smiling, comfortable, and happy.

But without saying any thing more on the pleasures and advantages of a rural life, I shall proceed to make some remarks on the nature of a country residence, and on the plan of this work.

The wants of man, even when in a low state of civilization, are such, that no one spot of nature is sufficient to supply them. If he take up his residence in a forest, he must have recourse to the open country for pasturage for his cattle, or for the cultivation of grain. This, from obvious reasons, he would

soon find inconvenient. If he resolved to live entirely on the plain, in order to guard his cattle and preserve his corn, he must first have recourse to the forest for wood, or to the loose rocks of the neighbouring hills for stones, to construct huts and fences. Water, it is true, he might generally command, by fixing on a spot near a spring or a river. Finding *some* of the advantages of this situation, he would easily discover methods of increasing its conveniences; and a very trifling reflection would suggest to him the possibility of intermingling part of the forest with the plain, thus to add shelter, shade, and fuel, to his house, corn, and cattle. These being continually in his view, he could easily guard them from the ravages of other animals, which would lurk in forests and commit frequent depredations on the flocks and corn in the vallies. To obviate the trouble of keeping, he would soon invent fences; and to provide shelter or shade, in seasons of excessive heat or violent storms, he would naturally have recourse to trees, either planted along those fences or collected in some place of no great use, and where, in all probability, they would grow spontaneously when surrounded by any rude fence.

It is easy thus to conceive what would be the appearance of a primitive country residence; which, in fact, would be nothing more than a farm and a farm-house of the rudest structure. As population increased, however, and property be-

came known, different orders of society would be established. These farms, when possessed by individuals in the higher classes, would be distinguished from those of the vulgar, by a due correspondency with their rank, fortune, or power,—as well as the nature of the country. In almost every case, in the progressive state of cultivation, that place would be considered as most elegant, which contained the greatest appearance of art, in the house, garden, and grounds. The surrounding objects being nearly in a state of nature, their beauties were unperceived, and no one could venture to put them in competition with the charms of novelty, and the appearance of wealth and power.

To give these appearances in a rude age and a wild country, little more would be necessary, after building the house, than to form near it a walled garden, and to place the divisions of the fields in straight lines. But in the progress of improvement, and as agriculture became general, inclosure would be common over the greater part of the country. This would lead to a progressive step of refinement, in order to preserve the proper distinction. Trees would now be planted, either in masses of artificial forms, in particular devices, or in avenues. And now the formation of a place would have some relation to the fine arts. The magnitude or architectural decorations of the house would be increased. The ground near it would be smoothed, and formed into terraces and platforms;

and, in time, bowling greens, labyrinths, parterres, and wildernesses, would be introduced, either in the gardens, or in some place convenient to the house. The trees in the garden, in order to distinguish them from others, would not only be placed in an artificial manner, but would also (thus more strongly to produce the strange, and excite wonder) be cut into singular shapes, sometimes of geometrical figures, as pyramids, cones, &c. and at others, into the figures of men or other animals.

Rural improvement still continuing its advances, to these decorations would be added other ornamental appendages, which might either arise from the manners of the people, the nature of the country, or the principle of imitating other nations. Thus one country might introduce architecture or sculpture, because it excelled in those arts: another might contrive fountains, which threw the water into the air, and produced an appearance of gaiety and coolness analogous to the climate and the temper of the people. Another nation might introduce water in the forms of ponds or canals, which are more still in their effect, but more useful in domestic or horticultural œconomy. These modes, characteristic of particular countries, have been imitated by each other and hence have produced a diversity of ornament and show. Thus statues, fountains, and ponds, are often found collected together in one place.

It should here be remarked, that the kitchen garden, which still formed the capital feature in the place, and was the usual receptacle of these decorations, was generally placed in front of the house, and consequently would be the chief resort of such as chose to walk for pleasure. This garden, in cold climates, was always surrounded by a strong and high wall, which added to its security, comfort, and utility. In laying out the walks and divisions, every thing was done by lines, distinguished from those in nature by their simplicity and determined character. They were either perfectly straight, or regularly curved. In the general disposition of these lines, symmetry and regularity were prominent features. Avowed consequence and formality gave the leading hints in conceiving the whole design. Symmetry directed the execution.

In this state was the art of laying out the grounds of a rural retreat all over Europe in the beginning of the eighteenth century. But when mankind are in a progressive state of civilization and refinement, the polite arts seldom remain dormant:—they either make advances toward nature, which is ultimately perfection in every polite art, or they are entirely neglected, and sink into their primitive rudeness.

To the immortal honour of this country, the art of laying-out grounds was destined to make one advance, to which it had

never before approached in any age or nation. A painter, uniting his profession with that of architecture, happened to be employed on a small estate near London. There he ventured to extend his operations from the house to the scenery; in managing which, he produced a new style of Ornamental or Landscape Gardening *: a style, the imperfections of which ought not to detract from the merits of its inventor, who deserves our gratitude for introducing it, and who has justly obtained this praise from the common voice of the age. From the nature of the place first modelled in this style, from Mr. Kent's want of practical knowledge in husbandry, as well as from some professors who evidently never practised from principle, but merely from imitation, several difficulties arose, which have retarded its progress toward perfection; and which have contributed to establish a style much worse than any of Mr. Kent's works; I mean that of Mr. Brown, who seems evidently to have been guided by the idea of one model which might be applied to every situation. Many of the defects and absurdities of this style are known to men of taste. It is, however, still generally followed by the professors of landscape gardening, and often with a rigid adherence to the plan of their great self-taught predecessor. Of this any one may be convinced, by viewing a few of such estates as are at present under

* First so denominated by Shenstone, in his Remarks on Gardening.

their operations. Trees are still planted in clumps and belts; and parks could be referred to, laid out in 1804, if possible more ridiculous in these respects than even Fisherwick, one of Mr. Brown's first efforts. Water is uniformly confined in long canals regularly serpentine; and instances are common, both in England and Scotland, where natural brooks and rivers have had their banks shaped, sloped, and smoothed, and often their general direction rendered serpentine in imitation of made canals.

But these things, with many others practised and recommended by the followers of Brown, have not escaped the criticisms of men of taste. A few years ago Mr. Price of Foxley, and Mr. Knight of Downton, exposed its absurdities; the one in the "Essay on the Picturesque," and the other in "The Landscape," a didactic poem. These works have had considerable influence in stimulating a number of persons to think for themselves; and it is highly probable that they will finally effect a change in landscape gardening very different from Mr. Brown's system. Its introduction will be the more gradual, because in matters of practice men are less influenced by precept than example; but when once introduced, it is reasonable to suppose that it will be of longer duration than any style hitherto adopted.

Improvements in the architecture of mansions, and the other necessary or convenient appendages of country residences, have been gradually introduced in proportion to the progressive improvement and additional wants of society. From the earliest periods of British history, until the beginning of the sixteenth century, the mansions or castles were almost invariably built in that style generally denominated gothic, including several varieties, all which are easily distinguished from the regular architecture of Greece and Rome. In its rudest state it was introduced by the Danes, whose castles seem to have been little better than dungeons*. These were much improved by Alfred†, and afterwards greatly enlarged by Gundulph, Bishop of Rochester, who first introduced windows, sally ports, and greatly improved the forms of the loops or arrow holes‡. From this time improvements were rapid, until in the reign of Henry III.; the noble castles of Conway and Caernarvon, and afterwards, during the reigns of Elizabeth and James, Haddon House, Knowle, Kowdry, and Penchurch, may be said to have completed the progress of gothic mansions. About this time, Grecian architecture began to be mixed with the other style, which at first corrupted it, but afterwards, chiefly from Queen Anne's reign to that of his present Majesty, produced the magnificent palaces of Burleigh, Castle Howard, Blenheim, Ked-

* As Conningsburgh in Yorkshire, and Castleton in Derbyshire.

† Clifford's Tower at York is said to have been built by this king.

‡ See Rochester Castle.

dleston, Harewood, and Gossford. For some years back the gothic seems again to prevail, and with great propriety, as it is a style more congenial to our climate and purposes than any other. Some of the best gothic mansions erecting at present are Dreghorn, Belvoir, Loudon Castle, Scone, and Fonthill Abbey. The chief defects which have all along attended the progress of architecture in the *country* is the neglect of harmonizing the buildings with the situation, and a too great attention to minute external ornaments, which, amid the beauties of vegetation, and the intricacy of rural scenery, lose their effect, and only needlessly increase expenses. Now, however, symmetry and superfluous ornaments are giving way to irregularity and characteristic beauty. By this means much expense is avoided, and preferable effects with greater conveniences produced.

From this general sketch of the pleasures and advantages of a rural life, and the progressive improvement of rural architecture, and the art of laying out grounds, may be inferred the requisite qualities of a country residence. These are *utility*, *convenience*, and *beauty**, all of them depend upon the state of

* This term is used in two senses throughout this work. The first is that beauty which is analogous to female beauty, is characterized by *delicacy*, and may be denominated supreme beauty. The second includes every species of excellence in objects or scenery, except sublimity. The term picturesque is used, 1st. To denote that species of effect characterised by roughness, abruptness, and sudden variation; and, 2nd. For every species of visible effect which is agreeable to the general principles of painting. Good, true, natural, and genuine taste are used as synonymous terms, for that faculty which with its objects in regard to the material world is analyzed in Book I. Part I.

society and agricultural cultivation. What is useful and convenient in one age, may be useless, cumbersome, or inadequate in another. And what is ornament to a rude people in a wild country, may, where society are in a more polished state, and the face of nature regularly cultivated, be rejected for a portion of that wildness or natural beauty, formerly neglected for its superabundance, but now becoming valuable, not only from its rarity but congeniality to the human mind, when men are in that stage of improvement most proper for the discernment of real beauty.

In the following treatise the rules of GOOD TASTE, derived from natural scenery; and those of UTILITY AND CONVENIENCE, derived from the wants of every rank in the present state of society, form the general principles. The arrangement of such a work appears natural and easy. The first thing that would seem requisite, is to enquire into the principles of taste or beauty. This done, the next thing would be to enquire how far that art *(painting)* could assist us which has confessedly for its object the study of the effects of scenery. This is attempted in the essay on painting. These essays form the standard of beauty which is applied throughout the whole work. After treating on *taste* and *painting*, I proceed to those arts which regard utility, in connection with beauty; these are, *architecture*, *agriculture*, *useful* or *kitchen gardening*, *ornamental* or *parterre gardening*, *picturesque improvement*, *useful and*

picturesque planting, and the *conveniencies peculiar to a country seat*. These may be called the elementary branches of the art of forming or improving rural residences, and therefore they constitute the FIRST BOOK* of this work.

The SECOND BOOK treats, 1. Of the union or application of these elementary branches to different subjects, with a view to *the formation* or further improvement of different styles of residences; 2. Of the *preservation* and *future management* of residences agreeably to the same principles; and, 3. Of the *different styles* which have been used, in laying out the grounds of residences.

The THIRD BOOK treats, 1. Of the *choice of a situation* for a country seat, analogous to the mind and object in view of every class of purchasers; and, 2. Of the *motives to the introduction of good or natural taste* in rural improvement.

* In treating each of the different parts in this Book, I have first endeavoured to lay down its fundamental principles; next, their general application to practice; and, lastly, the particular relation or application of the art to country residences. This appears to me much the best way to enlarge the mind, and lead from the study of particulars (which too much engross the several followers of each of those arts) to habits of generalizing and abstract reasoning. The power of ascending from particulars to generals—from the soil and culture of a plant, or the mouldings of a cornice, to the design of a garden, or the elevation of a house; and from the design of a garden or a house, to that of a whole residence, constitutes the highest degree of professional excellence in this art. It is this power alone which can unite *beauty*, *utility*, and *economy*: the partial study of the art, and the neglect of some of the useful elementary branches, has occasioned such ignorance in regard to planting, convenience, expense, and execution, as often to have produced the most serious consequences to proprietors.

BOOK I.

PART I.

OF TASTE, CHIEFLY IN REGARD TO SCENERY AND ARCHITECTURE.

STANDING upon an eminence, and looking around us on rural scenery, we perceive a combination of a great variety of objects of different forms and colours, and of different degrees of clearness or obscurity. Mankind in general denominate the view grand, beautiful, fine, rude, barren, or disagreeable, as it fills them with pleasurable emotions, or excites sensations of disgust. The philosopher of taste inquires into the causes of these opposite effects which are thus produced upon the mind by different scenes; and he has been able to arrive at this general knowledge, that where the combination is *discordant*, disgust, or other disagreeable sensations, are produced; but where it is *harmonious*, the effect is always pleasing, and often fills the mind with the most exalted emotions of which our nature is susceptible. A lively sensibility to these effects is denominated *Taste*, or intellectual feeling. A knowledge of

the manner in which they are produced, is suited to perfect our judgment, and instruct us in the art of criticism ; and also to form artificial productions upon the principles which pervade the works of nature.

The *faculty* of taste results from the combination of five elementary senses. The objects of taste, or beauty, result from the combination of certain modifications of matter which correspond to those senses. As the result of the elementary senses is denominated Taste, so the result of the elementary modifications is called Beauty ; a term, in general, indiscriminately applied to all objects of superior excellence. Taste is inherent in the human mind, though in degrees varying perhaps according to the education, habits, and moral sentiments of men. The elementary principles of beauty are universal ; but their combinations are as various as the diverse forms of nature ; and their consequent effects pass all the gradations from the highest rapture to the coldest disgust.

According to this view of taste and its objects, an inquiry might perhaps be pursued in the following manner, viz.

1. Of the elementary senses of taste, and their union in forming that faculty of the mind.

2. Of the elementary modifications of matter which correspond to the elementary senses of taste.

3. Of the combination of the elementary modifications of matter, forming different kinds and degrees of beauty: or pleasing combination.

4. Of such combinations of the modifications of matter as are productive of particular expressions and correspondent effects on the mind, and may be denominated characters.

5. Of the exercise of the faculty of taste in discerning pleasing combinations or characters; and, finally,

6. Of causes which may influence our feeling and judgment in matters of taste.

To pursue the subject under these different heads with the requisite illustration, would occupy a considerable volume: here, a few remarks only can be noticed, with a view of bringing some of the more important particulars in this branch of science to the memory of the reader. The subject is confessedly difficult, and should therefore induce him to be the more ready to pass over such speculations or opinions as may not coincide with his own preconceived notions.

CHAPTER I.

OF THE ELEMENTARY SENSES OF TASTE.

THESE are simply the five senses; each of which, it may be observed, is capable of producing two different kinds of sensations upon the mind. The first kind of sensations seem merely for the purposes of the animal economy, and are enjoyed by many other animals in common with man.

The second kind of sensations are peculiar to man, and are acquired by practice in and reflection on the first kind of sensations. Thus, at first, we are satisfied with food or liquor of simple and mild qualities; but by practice we come to relish mixtures of sweet, bitter, acid, or astringent substances.

In music likewise, we at first choose or prefer simple sounds, with which we are pleased or affected according to the nature of the emotion which they are adapted to excite; afterwards we come to relish particular combinations of dissimilar sounds, in what is called harmony; and in this perception of complicated sounds we even acquire such an exquisitely delicate sensation, that the smallest discord disturbs our pleasure.

A similar refinement takes place in the olfactory powers. In our earliest youth, or when man is in a simple state, he relishes only the fresh smell of grass in spring, of hay in autumn, of fragrant flowers and such like simples; but by practice he acquires a relish for all the combinations of the perfumer.

In vision, we are at first most pleased with simple soft colours, as green, blue, violet, and gentle gradations of shade, as in round bodies; afterwards we acquire a relish for strong contrasts and harmonies, and dark shadows abruptly mixed with lights.

In the remaining sense of touch, there are similar secondary sensations, which are of various kinds, as that sense is diffused over every part of the body. Titillation is a secondary perception of the sense of touch, and the reader will recollect several others.

The union of these secondary perceptions of the senses constitute, as has been already observed, the faculty of taste. A person possessing this faculty, who formerly used to look at scenes only with a reference to the first sensations—who formerly admired cultivated fields of corn or pasture, cows, sheep, horses, fragrant flowers, singing birds, and crystal rivulets, (only for their utility) now derives his chief pleasure from

massy rocks, foaming cascades, deer, wild asses, neglected forests, eagles, and (in place of flowers) ferns and sedges. But as the elementary senses and their secondary sensations are not always present or perfect in each individual, hence arises a difference of opinion with regard to the beauty of such secondary combinations of scenery.

CHAPTER II.

OF THE ELEMENTARY MODIFICATIONS OF MATTER WHICH CORRESPOND TO THE ELEMENTARY SENSES OF TASTE.

Some of the modifications of matter are perceived by one sense only, as is that of smell or sight; others are perceived by two, as that of form, which we can both see and feel. This occasions a slight degree of intricacy in the division of these modifications; but the order in which they are noticed in this chapter is sufficiently clear for the proposed purpose.

Forms.—These are all compounded of lines; the two opposite modifications of which are circles and triangles. From the various combinations of these elementary forms are derived all other geometric figures, as squares, ovals, polygons, cones,

ellipses, as well as all the irregular forms of nature, which are without names. The cone has been reckoned the most beautiful, as uniting the three elementary forms of the *line*, the *triangle*, and the *circle*; but the chief reason why we denominate one object more beautiful than another, is generally from its relation to the female form, whence originated, not only the name, but likewise all our ideas of beauty. A well-proportioned female figure, placed erect, assumes nearly the form of two cones united at their bases*. The breasts are also each a cone, and the pupil of the eye a circle. The circular surface prevails also throughout the whole body, and hence is considered as the most beautiful in other objects.

Disposition of Forms.—Matter is not only capable of producing effects which result from its modification or form, but also from the disposition of these forms with regard to one another. A hundred small cubes, or balls, may be regularly placed at equal distances from one another upon an even surface. This is perfectly simple and easily comprehended by either the sight or the touch. But let these cubes or balls be

* It is remarkable, that the female dress formerly worn in this country had the direct tendency to counteract the natural form of the body, and, in place of two cones united at their bases, as in the naked figure, the order was completely reversed, and thus we had two cones united by their apices, as may be seen in any prints of the court dresses of the last century.

scattered irregularly, and in some places raised into small heaps, and a spectator, who had not seen the whole operation, will not be able fully nor quickly to conceive an idea of each form; and will be totally at a loss to know what is concealed in the heaps, whether forms of the same kind, or some others of totally different *qualities.*

HARDNESS, SOFTNESS, ROUGHNESS, and SMOOTHNESS,—are qualities of forms which perhaps might have been included under Disposition. They address themselves both to the sense of feeling and of sight. Separately, they are calculated to excite alternately pleasing and painful sensations; but, combined, their effect becomes exquisite. The eye acquires a knowledge of some of these qualities by experience; thus roughness is discerned by the abrupt union of light and shade; smoothness by their gradual intermixture, or by their equality. Brightness is the extreme of smoothness, and is a great beauty, as in the eyes of animals, and in water. It is always accompanied by roughness, which as uniformly produces shade, as in the eye-lashes and the shaggy banks of rivers, lakes, &c. If brightness any where exists without roughness, it is in the leaves of shining vegetables; but even in these, nature produces the effect of roughness by varying the surface, which, according to a simple law in optics, occasions a total absorption of the rays, and consequent darkness in one place; while the entire reflec-

tion of them in another displays light and smoothness. These effects frequently both happen in the same leaf at the same time, as any one may observe in the *camelia japonica*.

Colours address themselves to the sight alone. They may be divided into four kinds. 1. The cold colours; as green, blue, violet, &c. 2. The hot, or powerful colours; as red, orange, scarlet, &c. 3. The gay; or white. 4. The gloomy; or black. The cold are the most pleasing when alone; the hot the most striking; and consequently their mixture constitutes the most powerful harmony. The most agreeable and alluring harmonies are formed by the union of the hot and gay; as in the red and white of the human skin. The most disgusting are formed by the presence of the gay and solemn, when abruptly interposed; as in black clothes upon pale faces and hands, or white clothes on black or tawny people; or in mourning suits, where black and white stuffs are mixed and opposed.

Odours only affect the sense of smelling. They are either soft and fresh, as the smell of hay, lavender, roses, &c. or strong, as that of pine, birch, assafœtida, and the civet cat. The former are the most pleasing, the latter the most powerful. Their mixture is often grateful; as in spring, in a woody glen, where birch, pine, and willow, shelter violets, primroses, and wild hyacinths.

HEAT AND COLD are perceived by the sense of touch. Their combined effect is most pleasing in spring and autumn, which seasons are farthest removed from the extremes of each. When every part of the sense of touch is alike affected by heat or cold, the effect is most grateful; as in cold and hot baths, where one part of the body is hot and another cold; as is generally the case with mankind in clothed and civilized nations; the effect is more or less disagreeable, according to the degrees of difference between the temperature of each. The most grateful effect of coolness is in the mid-day breeze; the most grateful effect of heat in the tepid bath.

MOTION is perceived by the eye. The elementary motions may be reduced to two, *straight* and *circular*. The gradations of motion vary from the imperceptibly rapid to the insensibly quiet. Their compounds are produced either gently or forcibly. Such motions as are gentle, and in which the circular prevails, are the most pleasing and graceful; as in that of the bending of trees, the waving of corn, the flying of small birds; and, above all, the movements of the eyes and mouth in the human countenance, when love or benevolence reigns in the heart. Horizontal, angular, abrupt motions are generally the most ridiculous, as those of drunkards. Undulating and continued motions the most beautiful, as in dancing. Perpendicular descending motions are the most terrific, and perpendicular ascending the most sublime, &c.

Sounds are capable of producing very powerful effects upon the mind, either simple or combined, either melodious or harmonic. The melodious sounds of birds are the most universally pleasing; the roar of the sea, or the noise of thunder, the most terrific or sublime.

Gravity is another property of matter. It is at first known by the touch and the eye which discerns motion; but from experience we perceive it, in many cases, by the eye alone; which requires that erect objects be properly balanced, or have their line of gravitation pass through their centre.

Gravity requires to be particularly attended to both in the combination of forms, as in architecture; in their position, as in pruning trees; or in their motion, as in walking, &c.

CHAPTER III.

OF THE COMBINATION OF THE ELEMENTARY MODIFICATIONS OF MATTER FORMING DIFFERENT KINDS AND DEGREES OF BEAUTY, OR PLEASING COMBINATION.

Those qualities of matter which have been noticed seldom or never exist separately, but are combined with each other in different proportions. Colour, or motion, cannot exist without form, nor smell without substance. These combinations are fitted to excite strong or weak sensations or emotions upon the sense of taste, and according as these are pleasing or disagreeable, we denominate the combinations which produce them beautiful, disagreeable, or deformed. We receive different degrees of pleasure from different kinds of combinations; and consequently we ascribe to objects, or scenes, different degrees of beauty. To endeavour to discriminate the most material of these different beauties, or as they may be called elementary qualities of perfect beauty, is the purpose of this chapter. It may be remarked, that most of our disputes about taste belong to this branch of the subject; and the reason seems to be, that writers on taste do not agree as to what kind of beauty they expect to find in the object or scene under consideration.

Truth, or Nature.—The first thing perceived by the mind in any object, on its being presented, is its truth or falsehood, or in other words its congeniality. We instantly perceive this in the general form and parts of animals; and when we find the leaf of a tree, or the ear of a horse, not similar to those of its kind, we instantly pronounce it to be false or monstrous. The same thing applies to all the qualities of matter. A river of a red colour, or a bar of iron destitute of its usual gravity, or a horse with only one ear, are all monstrous productions, though in different degrees. Custom gives an air of truth or nature to certain objects, the want of which often produces disagreeable emotions; as in no case is more powerfully illustrated than in the dress of nations, either compared with each other, or among themselves, or even of the sexes in the same nation.

Utility.—This term is applicable to any union of the qualities of matter that is made with a view of satisfying, either directly or indirectly, the corporeal wants of mankind. Most implements of the useful arts please principally on this account. Utility is best perceived when accompanied with simplicity; as in the spade or plough; and least perceived when joined with complexity, which requires the assistance of reason, as in spinning or cotton machinery. An object with no other quality or property to recommend it than its use, is still pleas-

ing to those who are interested in it; but destroy that property, and it only excites our contempt.

Fitness, or Proportion, is nearly allied with utility, and always supposes that we are acquainted with the end or purpose for which the animal or object is intended. We could perceive no fitness in the proboscis of the bee, nor the broad finny feet of the duck, did we not know their relative use. We could not even judge of the fitness of a prop, or support, to bear the weight placed on it, if we had not some previous knowledge of the qualities of each. We have not always correct ideas on this subject; and hence we judge oftener from their imaginary than from their real qualities. This is one cause of the change of fashion in the proportions of the most common implements, or pieces of furniture; and it may serve to expose the absurdity of taking any one relative proportion as the standard of perfection for all kinds of columns.

Fitness of the parts in relation to each other excites approbation, even without knowing their use, or perceiving any other beauty in the whole. The opposite quality, insufficiency, always excites dislike.

Symmetry, or Conformity, is a term applied to that de-

gree of beauty which arises from seeing one half of an object correspond with the other; as in the human figure, and most animals, as also in the leaves of vegetables. Symmetry is the first beauty which we perceive after discerning truth, use, and fitness; and accordingly it is first attended to in artificial productions, by rude artists, where they attempt ornament. Masons would first adopt it in the windows and chimnies of buildings, afterwards in the breaks and recesses, and finally in the addition of wings.

The opposite of symmetry is disparity or disproportion; which, being inconsistent with use, fitness, or truth, is always displeasing in the extreme.

Uniformity is the constant repetition of one colour, sound, or other quality, among others of different kinds; as the leaves upon a twig, the windows in a house or street, or the columns in colonades, &c. It is a considerable beauty both in large and small objects.

Uniformity is either regular, as in the leaves on a twig; or irregular, as is often the case in windows in a front. In this last case, it connects itself with variety.

Unity is a term applied to such objects as have one general

quality which pervades the whole; as in the colour of a landscape under the warm tint of sunset; or of form, as in a grove of oaks; or of sound, as in the Scotch bagpipe. Unity is a very great beauty, and in landscape often supplies the place of many others, as in moon-light or twilight scenes.

Order consists in the relation of parts to each other, or to one common centre. Unity may exist in a mass, composed, for example, of twigs, branches, and foliage; but it is order only which forms them into a tree. An animal may be symmetrical, it may have all the members which animals of its kind have; but unless order dispose of them in their proper places, it will not be complete. It is order in the arrangement of the colours of the rainbow which produces a whole; for the same colours might have been placed together agreeable to the principles of harmony, and yet have made it appear as composed of two bows placed together. Regular order gives considerable pleasure, as in regularly trained trees placed against a wall; when joined with variety and intricacy, it is greatly heightened; as in a tree in its natural state, or any production of nature composed of many parts.

Confusion is the opposite of order; it is easily discovered; and its opposite is so generally expected, that the absence of no beauty, either in form or manner, so soon occasions dislike.

CONTRAST results from qualities being brought into combination which are of different natures. If they are opposite or contrary in every respect, they produce discord; if opposite or contrasted in a few particulars only, the effect is striking, and may produce either variety or harmony, or may serve to fix the attention on some beautiful figure or object*.

VARIETY is formed by the union of contrast with uniformity, or, in other words, by bringing objects or qualities together, which possess one quality in common, but in different degrees. Thus variety in colours is produced by contrasting different shades of the same colour together. Variety in forms, by contrasting the same form of different degrees of magnitude—when another colour or another form is introduced, it either produces discord or harmony.

Variety is bounded on the one hand by sameness, and on the other by diversity. The term Diversity is applied when many kinds of forms, colours, and qualities are brought together and represented in the same view; joined with regularity, it produces monotony; with irregularity, incongruity. The former may be exemplified by placing together one of every kind of form on a plain surface, or every colour upon a palatte or piece

* This is practised on the face, by placing black patches in proper places.

of canvass; the latter, by making two or three of the forms or colours more conspicuous than the rest. But if incongruity results from the want of unity in one quality of matter, it is still more conspicuous in the forced union of two qualities which fitness and truth require to be separate; thus a piece of architecture executed in stone painted *green*, or a tree cut in the form of a man or a horse, alike displease those of a chaste and natural taste.

Intricacy is different from variety, as it always requires the presence of two qualities, *form* and *colour*, *light* and *darkness*, or *form* and *disposition*. When we speak of an intricate form, we always refer to the qualities of its surface, or to the parts of which it is composed. Intricate objects, whatever may be the *form* employed, black, or a mixture of black with blue, is always the best colour; for as intricacy operates by concealment, which excites curiosity, no colour aids *disposition* so much as black, which of itself serves to obscure objects, while disposition totally conceals them. Still, however, there are forms better adapted for producing intricacy than others. Lines, when properly disposed, are much better than either squares or circles; as we may observe on the rough grassy banks of water, or in the hair or wool of animals.

Harmony is the last and most exquisite combination of the

modifications of matter. Variety is composed by uniting different degrees of the same modifications; but harmony admits of modifications of different kinds. In other respects, their general principles are the same. Harmony lies between discord and variety; and the great art in forming harmonious combinations in architecture, music, and painting, in which arts it is best understood, is to prevent it from degenerating into the one, and proceeding to the excess of the other. The irregular style of Gothic architecture affords ample scope for contrasts, both in the form and disposition of solids, and in the magnitude, shape, and disposition of openings; from productions of this kind it is easy to perceive that most artists are more influenced by Grecian architecture and a veneration for antiquity, than guided by any fundamental principles. Hence the frequent absence not only of harmony but of the lesser beauties of fitness, intricacy, and variety.

CHAPTER IV.

OF SUCH COMBINATIONS OF THE MODIFICATIONS OF MATTER AS ARE PRODUCTIVE OF PARTICULAR EXPRESSIONS AND CORRESPONDENT EFFECTS ON THE MIND, AND WHICH MAY BE DENOMINATED CHARACTERS.

BUT INTRICACY, HARMONY, OR VARIETY, or any other merely pleasing combination of the qualities or modifications of matter,

are far inferior to such as are expressive of sentiment or character. This will be easily understood if we apply the remark to the productions of music or painting, to the physiognomy of the human countenance, or to the moral actions of men. Every one knows the difference between that mixture of musical sounds which pleases the ear, and that which touches the heart—between a common-place countenance, and that which indicates the prevailing faculties of the mind. A simply good man is but a pleasing and useful being; one remarkable for the excess of some quality of mind is always interesting. All these sentiments, emotions, or expressions, may be traced to the association of ideas*. In architecture and scenery, such objects or scenes as produce them are denominated characters. The most powerful and universally distinguished emotions which are produced upon the mind are by the characters of sublimity and beauty; but there are other emotions which, if they are not of a nature specifically different from these, yet the terms applied to them are still deserving of attention in this work; and the characters themselves deserve study on account of their agreeable or pleasant effects upon the imagination. Some of the principal of these shall be noticed after the characters of Sublimity and of Beauty.

* See this beautifully explained by Hartley—"Observations on Man," Vol. I. ch. 1. and 2.

Sublimity.—In visible objects, this emotion * is produced by immensity; as the ocean. By great dimensions and determinate variations of outline; as in mountains, and the sky outlines of buildings. By considerable dimensions and indeterminate variations of outline; as in objects placed more or less in obscurity, as large ships, towers, or castles appearing through dark fogs; or mountains with their tops hid in the clouds. It may be produced by magnitude, succession, and uniformity; as in ample colonades; or by great height or depth; as in spires, precipices, &c. &c. Whatever gives the idea of immense power, either exerted, or capable of being brought into action, seems to convey this emotion of sublimity. But, after all that has been written upon the subject, it is difficult to offer any thing conclusive as to the final cause of this emotion. Certain it is, that love and ambition are the most powerful passions in the human mind. Power is the object of ambition as beauty is the cause of love. When power is exerting for, or apparently for our destruction, it causes terror, or the loss of reason, as in a violent storm at sea, an engagement, or on a death-bed. When it has been exerted in time past, or is exerting, but in a way which does not endanger our lives, as in buildings, viewing the calm ocean, &c. it often, if not always, raises the true sublime.

* For the difference between *emotion* and *sensation*, see Allison on Taste.

Beauty.—Such objects only as excite our love of possession, whether from their rarity, or suitableness to our ideas of communicating pleasure, are generally termed beautiful. Supreme beauty, to the mind of man, is only found in a lovely woman; the beauty of all other objects may be termed relative. With respect to forms, and other qualities of surface, we consider those as most beautiful, which approach nearest to that of woman: thus gentle undulations, insensible transitions, smooth and soft surfaces, circular or conical forms, are all termed beautiful, except when they are connected with some moral evil or deformity in relation to man.

The most beautiful women, either in form or colour, are always tender and delicate. Delicacy and refinement, indeed, seem necessary properties of beauty; for it is in these respects that the form of woman differs chiefly from that of man. Accordingly, whatever communicates the appearance of delicacy to objects or scenes renders them beautiful. This appearance may be given in supports, by employing a smaller quantity of materials, as in elegant furniture or columns; and in other bodies by undulations, smoothness, and tender ornaments or colours, as in fine veined *mahogany;* or by clearness, as in works in iron or glass, as grates, chandeliers, &c. Such properties in these kinds of objects are universally called beautiful or elegant (for the terms are synonimous when both are in fashion),

except when these qualities are not in repute in such objects; but still men of true taste will perceive them; and any other fashion is mere whim or caprice, and never can excite any other emotion than that of surprise, which is not of long duration.

Deformity and (ugliness or) disagreeableness are the opposites of beauty. Disagreeableness refers chiefly, if not entirely, to the surface of objects; and is applied, when they want that smoothness or clearness which we expect in such as pretend to beauty. *Deformity*, as the term implies, refers to the form, and is applied whenever that deviates from truth. In some respects it is nearly allied to monstrosity; but this term generally implies a deviation from truth, by the addition, or from the absence, of some part or quality. In deformed objects or scenes, every part exists, but with some deviations from the beauty or usual form of such parts.

Disagreeableness, or deformity, is frequently applied to such scenes as are injurious to mankind from moral qualities, though the scene may be harmonious of itself: thus a fen covered with poisonous plants, serpents, and pestilential exhalations, forms a unity or whole; but in relation to the rest of nature it is deformed, and to man it is discordant and produces disgust.

Picturesque Beauty. This term seems to have been originally applied to such objects or scenes as were best suited for producing a good effect when painted. It is now applied more generally, and is characterized by roughness, abruptness, and irregularity, either in the outline, form, disposition, or colour.—*See* Price's *Essays*.

Sculpturesque Beauty may be applied to such objects, or figures, as are peculiarly calculated for being represented by the art of sculpture.

Antique Beauty is applied to such works of art, particularly in sculpture and architecture, as are in design similar to the productions of antient Greece or Rome.

Romantic Beauty is a term applied to such scenes or objects as are more like the fanciful productions of romance writers, than general nature. It unites the grand without the awful, the wild without the savage, the solitary without the forlorn, the cheerful luxuriance and variety of nature without the teeming abundance and regularity of art.

Wildness, as opposed to the elegance and refinement of culture, or polished nature, is occasionally a great beauty; as, in spots of heath, furze, thorns, or copse, when amid the more rich

scenery of parks; or a few wild gipsies scattered among the dressed villagers at a wake or fair. Wildness is an exquisite beauty, and will increase in rarity in proportion as countries become cultivated and the people civilized. Then it will have more of the charms of novelty in addition to its intrinsic suavity: it differs from savageness, in presenting more serenity and fertility, and less rugged sublimity.

Tranquillity is a term applied to such objects or scenes as, when viewed, leave the mind in a state of rest. Stillness, seclusion, and solitude, are requisite for producing this effect.

Melancholy.—Unity, and simplicity either in form or colour, with a marked appearance of drooping and dejection, are called melancholy, from the relation between their appearance, and the state of the mind when under that disease; as in the weeping willow. Solemnity is nearly allied to it, as in the yew and cypress. In lines it is indicated by such as are straight degenerating into circular ones; as may be seen in high walls bent or twisted, or large ruins. It is striking in the river front of Warwick castle, from these causes.

Age and Ruin, whether of animated nature, trees, or buildings, have expressions peculiar to themselves. Painters com-

monly denominate them picturesque; but the emotion which they excite in the bosom of the man of taste is that of reverence.

Elegance is a term applied to such objects as show a degree of refinement, or smoothness of surface, and delicacy of proportion, when compared with the general appearances of such objects. It changes its meaning with the fashions, and is often applied to any kind of form or colour which deviates from, and has the appearance of being more expensive than, those of the same kind in common use; as is the case in new or fashionable furniture. It is no character, but merely a term deserving explanation because much used.

Gaiety is applied to such objects as fill the mind with cheerfulness; as the sportive play of animals, or water from a fountain, &c. or in colours, to white-washed cottages, &c.

Novelty.—Though this cannot be called an inherent expression in objects, still such objects or scenes as we have never observed before communicate a pleasure seldom surpassed by such as are familiar to us. The highest degree of novelty is that when an object is not only new, but of a strange or uncommon nature. But unless objects have something more to recommend them than novelty, they do not continue long to please.

Ridicule is produced by contraries and incongruities, and excites risible emotions very different from those of taste. Being chiefly applicable to the imitative arts, it is the less connected with the subject of these remarks.

There are many other epithets or characters of expression belonging to combinations, or even to single modifications; but they are not so immediately connected with the subject of this work as those which have been noticed. The mind conforms itself to the nature and appearance of whatever is presented to the senses, and experiences a sensation or impulse analogous to the nature of that object. The idea of that sensation is understood by the general term expression; and the particular conformation or disposition of the parts which produce it is called character. Thus all trees consist of a certain harmonious combination of branches, twigs, and leaves; but it is the particular conformation of these in each species, which constitutes its character, and gives it expression. Expression is indispensable to every object or scene designed to please; for, whatever we see or hear, unless it communicate some sentiment, or excite some particular emotion, we pass it unnoticed; as the want of such expression implies that it has no communicable feature or character. Whether objects be beautiful or merely useful, we always endeavour to describe their peculiar beauties or uses, that is, their particular expressions.

CHAPTER V.

OF THE EXERCISE OF THE FACULTY OF TASTE IN DISCERNING COMBINATIONS AND EXPRESSIONS.

HAVING slightly noticed the formation of the sense of taste, by the union of the five elementary senses; and having also glanced at the combinations of the modifications of matter, which are its objects; the next thing, in a dissertation on this subject would be to treat of exercise and its effects on that faculty. Here, however, it is only necessary to make a few general remarks.

Taste, like every other faculty of the mind, is improved by exercise. This consists in viewing, comparing, and judging of such works of nature and art as are particularly distinguished for their excellence. It is by these means alone that taste becomes delicate, sensible, and refined; that the amateur can judge with correctness, and the artist produce works worthy of attention. A taste thus improved will, no doubt, receive less pleasure from general objects, than that of a person destitute of the power of judging with accuracy; but when it does perceive true excellence, the pleasure derived will be much more exalted and exquisite than that of the other. In

particular, many of the superior beauties of nature which escape common observation will fill improved taste with a rapture and enthusiastic delight to which most men are entire strangers. But a man of improved taste still receives considerable pleasure from viewing less perfect productions; from the exercise of his judgment in determining what is right and wrong, deficient or superfluous; or in works of art he may be gratified by perceiving the dawnings of future genius.

An ardent passion for objects of taste, like keen feelings or strong passions in life, are alike dangerous when not joined with a sound judgment. In the arts, taste without judgment produces the most extravagant productions, under the fancied impulse of genius: ardent passions, ungoverned by judgment, hurry us into the most improper and dangerous actions, under the guise of love, honour, or even virtue. These evils however, though like many others they work their own remedy, often have effects which a long perseverance in a contrary practice can scarcely remove. Nothing contributes more both to the moral and political government of the passions, than the rigid discipline required by the principles of good taste, which are always in unison with those of good morality; and without the latter, the former cannot exist*.

* "A woman without virtue is never beautiful," say the Italians with much truth.

By constant observation, and the practice of viewing objects of taste, a person may acquire a delicate and just feeling, though he may not be able accurately to describe the causes of pleasure or dislike being excited by particular objects. Thus in music, many have what is called a good ear, or a delicate and accurate perception of melody and harmony or discord, who yet may be quite unable to compose a tune, or to explain the principles of harmonious and melodious combinations of sounds. A similar kind of perception takes place in painting; where the artist often produces beauty entirely from feeling, without being able either to reason himself into the production of a good landscape; or to analyze a picture, and say precisely *why* this or that part produces more pleasure than other forms or colours which might have been substituted in their place. The constant practice of seeing and comparing the various beauties of nature and art is of the utmost importance for such as would aspire to a critical knowledge. Nature is the source of every excellence; in her productions the student ought ever to exercise himself; not merely in relation to visible objects, but to general laws, harmonies, and moral relations, which do not appear to the eye which gazes only on the surface. This way of studying nature, not in opposition to, but in conjunction with those arts which relate to visible objects, has a tendency to produce a just judgment both in taste and morals. Without taking this general view of nature and mankind, we can only study

scenery with a reference to some art or system to which we are shackled by habit and ignorance. But such a general view of nature as I have mentioned, and as may be called universal taste, is, even though incomplete, the source of the highest delight which man can enjoy. It is by these means that we find

> " ——————books in the running brooks,
> " Sermons in stones, and good in every thing."

CHAPTER VI.

OF CAUSES WHICH MAY INFLUENCE OUR FEELING AND JUDGMENT IN MATTERS OF TASTE.

Doubtless, many inconsistencies occur in our decisions; and it is the common source of disputes in matters of this kind, which has occasioned the well known adage, " that there is no disputing in matters of taste." The business of this chapter should be to inquire into the chief reasons of these inconsistencies; but as this would require more discussion than can be admitted in a work of this nature, I shall do little more than state them.

1. The senses which compose or administer to the faculty of taste may be all imperfect, or partly so; or some of them not sufficiently cultivated, or totally wanting.

2. The other faculties of the mind, as the moral sense, memory, imagination, judgment, &c. may be imperfect, or cultivated in different degrees. The want of a well-cultivated imagination, in particular, will render the impressions made by painting, poetry, and sculpture, comparatively weak, and even erroneous. A good understanding may enable us to compare the representation with the thing represented; but unless it has often been employed about objects of the same kind, and has treasured or accumulated an ample stock of ideas in the mind, we naturally stop, and think of no farther pleasure; or else endeavour to find beauties and resemblances which were never intended. But a single idea of excellence presented to the fertile imagination rouses a long train of corresponding sensations, which often carry us, as it were, beyond ourselves into the regions of romance and enthusiasm.

3. The limited sphere of some individuals may have proscribed their knowledge of objects of taste, and thus vitiated their natural faculties. But though this can never be supposed to take place in general, it may, and really does frequently happen in particular cases. Thus travellers are often ready to

consider those regions as most beautiful which most resemble their native country; the lover thinks those females most enchanting, whose features, forms, or manners, bear most relation to those of his mistress, &c.

4. Association of Ideas.—From habit, a particular person may have certain ideas which present themselves to his imagination whenever he views a certain class of objects; and at the same time another person, of a taste equally delicate and cultivated, may be totally destitute of such impressions, or what are called associated ideas. This alone would not be productive of disputes, if the person having such ideas could, in judging of real merit, so entirely divest himself of them as to be in the situation of the other; but this is rarely to be expected. Could it indeed be effected, the first and most important advantage which would result from it would be the formation of a standard of taste: but until men's judgments shall enable them to lay aside all false associations, and agree in what is general nature, a perfect standard in taste cannot be produced. And as this, in all probability, can never take place in the full extent of the word, it is the safest and best way, 1st, to lay aside all differences about trifling objects; and, 2dly, to treat the opinion of those who differ from us in important particulars with deference and respect, or pass them over in silence; according as they may be agreed in their general

feelings and judgment, with such emotions as have been confessedly felt by all men of taste; I mean the emotions excited by sublimity and beauty.

CONCLUSION.

The progress of taste in the human mind admits of three divisions. The first is from our earliest years, until a relish for the sublime, and the chief sorts of beauty*, is acquired. The second, from that period until the judgment in matters of taste is matured. With respect to artists, poets, musicians, or those who are capable of embodying their ideas, a third period may be said to commence; which is that wherein they produce works of genius. Formerly, nature, or the models of a master, were indiscriminately copied by the artist: now he selects, arranges, and forms new combinations of his own. These three stages of taste, so to speak, are perfectly applicable to architecture and landscape gardening. Those who begin to design, either for their own properties or for those of others, before they have a feeling for beauty and character, will do much mischief. Those who begin to do it before their judgment is

* Such as supreme beauty, picturesque beauty, and antique beauty.

matured, run great risk of producing absurdities, even though they may have good taste and sense in other kinds of productions. And the misfortune is, that persons who begin to improve in this stage think that no effect can be produced without performing a great deal, or overcoming some natural obstacle, the doing of which may excite the admiration of their neighbours; and the common consequence is, that they involve themselves in an immense expense without producing any adequate beauty or advantage. But those whose more matured judgment may enable them to think for themselves will, in all probability, produce effects striking and natural, even without the aid of much experience. A taste for beauty, even though unattended with mature judgment, will most frequently be of vast importance, as well to those who lay out their own grounds, as to those who commit them in some degree to others. It will enable them to throw off the trammels of custom, prejudice, or system, and give way to the natural feelings of the heart. In this way, a proprietor would get his house or his place formed in a style analogous to his own mind, which would unquestionably give him more pleasure than any other style.

BOOK I.

PART II.

OF PAINTING.

INTRODUCTION.

THE art which, next to the study of the principles of taste, will contribute most to improve the ideas of a rural designer, is landscape painting; which, indeed, is so much connected with taste, that the study of the one ought to go hand in hand with the other. The remarks which it is proposed to offer will be chiefly with a view to shew the importance of this study. They shall be included under the following heads:

1. The general principles of landscape painting.
2. The advantages to be derived from a study of the principles, and also from the practice of this art in architecture, and the laying out of grounds.
3. The advantage to be derived from studying prints and paintings.

CHAPTER I.

OF THE GENERAL PRINCIPLES OF LANDSCAPE PAINTING.

The student in landscape painting, before he presumes to design from imagination, must acquire a facility in copying objects, and must study nature until he can distinguish her productions and effects. This done, he may select and combine, according to his own fancy or imagination. Supposing him about to paint a landscape, all the leading operations will be included under the following heads: Design, Disposition, Drawing and Perspective, Light, Shade, and Keeping, Colouring and Expression.

1. Design.—The subject or style of landscape being given, or conceived in the mind of the artist, design relates to the production of a whole by a proper selection of separate parts, which shall mutually co-operate for this purpose. Thus, suppose the subject given be a landscape with the sun setting: the artist will first consider in what kind of country nature produces this effect with most advantage. He will probably conceive that a mountainous country, with a large river watering a fertile valley, and losing itself in the ocean, will furnish fit materials for such a picture. As every striking landscape consists of three marked

distances, he will probably propose—1. A bold foreground containing rocks, a large dark group of trees, and some cattle.—2. A rich middle distance of rocks, buildings, hills, and woods, gliding into (3) the ocean, as the background.

2. Disposition.—We have now the three distances distinctly marked out, and the materials which are to compose each rudely thrown in. Disposition combines, arranges, and groupes these parts so as to produce a harmonious whole. The great art of grouping lies, first, in contrasting the same parts of objects brought together in one group; and secondly, in contrasting the groupes with each other. Without grouping, every thing appears scattered and unconnected: instead of unity of expression, or a whole being produced, which is the ultimate end of painting, the result is incongruity, which becomes disgusting in proportion to the number and diversity of objects jumbled together.

3. Drawing and Perspective.—These branches of the art are so generally studied by all who have the least pretensions to composition, that it is only necessary to observe, that a thorough knowledge of the last is of great importance in laying out grounds, no less than in architecture, as will appear in the sequel.

4. Light, Shade, and Keeping.—The forms of all the objects in the landscape being now determined, the next thing is to give them substance. This is accomplished by lights and shadows; the modes of forming which, whether in oil or water colours, are generally known. A second use of light and shade is for effect; and nothing contributes so much to form a whole, whether in a picture or a real scene. In the landscape which we have designed, disposed, and outlined, the great mass of light will be thrown on the distance and water, and the great mass of shade on the foreground, and the trees, whether there, or in the middle distance, which are opposed to it. A third use of light and shade is called Keeping. This is what produces aërial perspective, and is effected by making the objects which are nearest the eye darkest, and letting them die away as they recede into the remote distance.

5. Colouring.—In painting, colours are divided into two kinds only (light and shade, including the black and white colours): the cold; as blue, lilac, green, &c.: and the hot; as red, yellow, orange, &c. These two classes, when mixed together, are capable of producing varieties, harmonies, discords, and privations. Harmony ought to pervade every picture; and where a strong effect is to be produced, one colour ought to prevail over all others, and be echoed (so to speak) throughout the whole piece. Thus in the landscape which we have now

supposed shaded, the red and orange colour of the evening sky is reflected in the water, and upon the tops of the mountains; on the light side of the rocks and buildings; and, more or less, on every light object in the picture. The natural contrast to this colour is greenish black, and purple; the former in the foreground; the latter in the distance, and on the shadowy sides of the clouds.

The general effect and expression of the picture being now completed, we have only to add the last touches. These may be included under—1. Expression; and 2. Grace, which supposes figures or animals to be introduced.

1. Expression relates to the trees, animals, plants, and every object near the eye, and serves to characterize the different kinds of each; not the minute botanical differences, but the general distinctions. Thus the finishing *touch* of an ash, oak, elm, and beech, are each different. The first is loose, somewhat drooping, and free; the second horizontal, firm, and close; the third a medium between these extremes; the fourth compact, pointed, and upright, &c. The *touch* of the Scotch fir, larch, and stone pine, are equally distinct from each other, and totally different from those given to deciduous trees. Indeed almost every species of tree has a distinct kind of *touch*, which serves to characterize it. In the indigenous plants and

trees of Great Britain these may easily be acquired by observing nature; but exotic sorts are either so crowded among others, and confined in their growths; or are as yet so sparingly introduced into this country, and at all events so young, that the central form of the *touch* of each species, cannot at present be acquired.

2. Grace is the next consideration in finishing the parts: it applies chiefly to the human figure, and is given principally in the drawing; though in single figures it may be greatly lowered or heightened by judicious *touches* in the finishing.

CHAPTER II.

OF THE ADVANTAGES TO BE DERIVED FROM THE STUDY OF THE PRINCIPLES AND PRACTICE OF PAINTING IN ARCHITECTURE AND THE LAYING OUT OF GROUNDS.

The foregoing remarks may serve to recal to the reader the leading principles of painting, and are sufficient in this place to enable me to shew the use of that art in the creation of real landscape. This I propose to do by making a few remarks—1. On its use in perfecting the faculty of taste. 2. Its assistance in leading us to discriminate character. 3. The use of

the principles of composition. 4. The use of perspective. And 5. The use of drawing in water-colours.

1. Its use in perfecting the faculty of taste.—The first advantage which results from the study and practice of painting, is a taste for excellence, and especially picturesque beauty, in most visible objects, both of landscape and architecture. An improver, ignorant of the principles and dead to the excellencies of painting, will look at nature only with a reference to the mechanical principles of his own art, as a mere walk-maker, clumper, or grazier; and of course he will admire only such trees as are regular and present one mass of smooth green, and such groupes as have fewest undergrowths and are nearest the shape of the clump. All rough plants, ferns, or low growths, he will disregard, as obstructing the smooth surface of the pasture; and all natural paths please him only as their direction is formal or serpentine and their edges marked by distinct straight lines. But a person who has studied painting acquires a relish for connexion, intricacy, and truth; and soon perceives that the chief excellence of rural scenes consists in the prevalence of nature. Hence wherever nature is to prevail, he wisely judges either to conceal art, or banish it altogether. His walks are only marked with distinct edges in scenes avowedly artificial, as near the mansion and in the kitchen garden. His trees and shrubs are never

forced into formal shapes, except in hedges, which are regularly shorn for particular purposes of utility; and his turf is only made smooth, and the fern rooted out, in the *Ferme ornée*, or where the utility of the pasture is intended to prevail over the effect of the foreground scenery.

A similar revolution will take place in the taste of a mason after studying painting. Instead of endeavouring to shew his skill in the five orders upon every occasion; instead of crowding together ornaments which have no reference to utility, or decorating a cottage or villa with the appendages or parts appropriated to the palace or the temple, he studies first the use, and then the character of his subject. He makes simplicity the prevailing idea in a cottage, elegance in a villa, and grandeur in a castle: these qualities in each he combines with use; and thus, from a mere builder, he becomes an architect.

2. The next advantage resulting from painting is the power of discriminating character. At first, the mind naturally thinks only of parts. Now it views these parts in relation to a whole; judges of their agreement or disagreement, of their general effect, and of their distinguishing characteristics. This is of great advantage, by enabling us first to discover the tendency of any scene to a particular character; and then to heighten or complete that character, by the addition of such

objects as are necessary, or by the removal of such as are offensive. Another advantage is, that by enabling us to discover in what character consists, we can frequently create that excellence where nature appears indifferent or disagreeable.

3. The next advantage to be derived from painting is, the art of composition in real scenery. Here, though the design be, as in painting, first formed in the mind, the disposition, light and shade, colour, &c. are not added in succession, as in that art, but are all brought forward at once; wherefore the whole knowledge of the principles of painting must be concentrated and applied in one act, and this act is composition. The idea of unity of character being formed where a real scene is to be created, the principles of grouping, and light and shade, are of immense importance in the execution. Without a judicious mixture of light and shade, no piece of masonry is worthy the name of architecture; and without attending to the principle of grouping, no building will unite with the surrounding scenery. In planting and modern gardening the neglect of grouping is a fruitful source of distinctness, formality, and a kind of unnaturalness evident to a painter at first sight, and which effectually distinguishes made scenery from that of nature, when even no mechanical effect of art is seen. This is exemplified in almost every park or pleasure ground.

The principles of grouping are the chief guides in thinning old plantations or clumps, and even in pruning single trees: indeed there is no one principle of painting more extensively applicable in rural improvements.

4. The knowledge of perspective and optics is of very great use both in architecture and the laying out of grounds. In altering or improving old places, or in uniting scenery where trees already exist, it is one of the leading principles. In hilly or mountainous countries, when young plantations are to be made on their sides, it is of great importance. By attending to it in forming their outlines, the hill may be made to assume a woody or clothed appearance, by covering only a very few acres, and thus preserving most of the ground which by the plantations will often be rendered of double value, either for pasturage or aration. In the north of Scotland I have had frequent opportunities of contrasting this practice with that of making only one large inclosure unconnected with every thing else; which, while it had no more the appearance of massiveness than the other, covered the whole surface, and left none for agricultural purposes.

5. The next advantage to be derived from the art of painting is of less importance than the former; but still has its use,

especially to the artist. It is the art of drawing in water-colours. By means of this art, effects may be shewn upon paper before they are produced in scenery; and thus proprietors or others may conceive more clearly the ideas of those who propose to improve either in landscape or architecture.

A person accustomed to draw from nature, or good copies, will often, in a degree mechanically, introduce proper and according objects into his landscapes; although, in speaking or writing on the subject, he would perhaps be at a loss how to proceed. A striking instance of this I have in my mind at present. It is a scene in which a painter, once attempting to make a picturesque foreground to a small pond, collected at random a number of round and narrow stones of fantastic forms, incapable of any breadth of light or shade, and of course of all strength of effect, and placed them among ferns and other plants on its margin. Had that painter introduced stones on his canvass for the same purpose, he would have chosen broad massive forms, and given them a breadth of effect suitable to the nature of the subject; but he would have done this evidently from mere feeling, without reason or judgment.

Every architect must have experienced something of the same kind when he first began to design buildings in perspective. The hand naturally, and without thought, groupes the

parts, harmonizes the forms, and seldom leaves the pencil with satisfaction till it has completed a whole. But this idea is more strikingly applicable in landscape painting; because on paper the forms and shadows are completed at once; but in the reality the first operation in producing these is merely planting a seed, or a young tree scarcely visible. Thus, suppose in grounds an upright rock of a formal even surface, and naked above; that is, presenting to the eye one mass of light unbroken by shade. In what way would a person, who had never studied drawing, or the principles of painting, attempt to improve that rock? The truth is, he would not think of improving it at all. But teach him the art of drawing for a few weeks, without saying any thing of general principles, and then place the outlines of such a rock before him in an unfinished picture, and he will insensibly, as by instinct, disguise its uniformity, either by perpendicular breaks and shadows, or by overhanging it with trees, bushes, or creepers. *This* use to be derived from painting may appear fanciful to some; but I believe most artists will be inclined to think it true not only in the practice of painting, but also in the other arts, as sculpture. It is even evidenced in some degree in cabinet-making; where very beautiful forms and combinations are frequently produced without much knowledge or forethought.

CHAPTER III.

OF THE ADVANTAGE TO BE DERIVED FROM STUDYING PRINTS AND PAINTINGS.

The study of pictures, in connexion with that of painting or drawing, will facilitate the acquirement of the general principles of the art, and materially contribute towards the formation of a good taste in visible objects. No guide is so useful, for enabling the improver to discern the excellent from the inferior scenes in nature; and, in general, no study can better direct the architect, both in chusing the forms of his buildings, and in suiting them to the surrounding scenery. In forming ideas of buildings from pictures, however, care must be taken to distinguish between the effects of time or accident, and the result of good taste in design. Many Italian edifices, stuck round with pilasters, half columns, and other useless appendages or degraded parts, are in a bad taste, and could never give pleasure to a person who had studied fitness and painting, and applied their general principles to the art of building, without being prejudiced in favour of any style or set of models. Still such edifices are not unfrequently introduced into the landscapes of the best masters; but then, either in ruins, under

particular effects of light and shade, or so disguised by other objects as not to strike those who look only for the general effect or expression of the composition. It must be remembered also, that the least break or projection, which in the reality may be scarcely discernible, will, by particular modes of opposing objects to the light, appear to produce considerable shadows in a picture, which it would very seldom do in the reality. This may be productive of great mischief, respecting these effects, should the architect copy such absurdities. But the great use of studying pictures is to direct the improver to proper subjects in nature; there he not only sees the effect, but can examine every object and part of the scene on all sides; he can discriminate the species of trees, the nature of the soil, the progress and decay of vegetation, and a number of other circumstances, of which a mere student of pictures can form no idea. In this study, the improver must be guarded against mistaking the idea of mere copying without attending to principle, and of mistaking peculiarities for general nature. The study of pictures may direct him as far as relates to visual effects of objects. But the particular soils and situations of trees, shrubs, and plants, can only be acquired by comparing one part of nature with another, and finding the general medium. In this study, botany and husbandry are of particular advantage, as will be seen in the proper place.

BOOK I.

PART III.

ARCHITECTURE.

INTRODUCTION.

NUMEROUS dissertations have been written on the origin and antiquity of architecture, which it is unnecessary to repeat: all these have proceeded on the self-evident necessities of human life, and the early adoption of some means of defence against the inclemency of the weather. It is of no importance, of what form, or with what materials, original huts were constructed; there cannot be a doubt that in these particulars they would differ according to situation, climate, and other circumstances. It is sufficient, when enquiring into the fundamental principles of this art, to know that they were constructed for the purpose of utility; and whatever were the forms or materials then used, there can be no reason, in the nature of things, why such forms or materials should be used ever after: on the contrary, as

society improves, propriety requires a corresponding improvement in the arts which are subservient to its purposes. The progress of improvement in every art consists in two things—the addition of *conveniency*, and the introduction of *ornament;* the former, to render the habitation of man adequate to his wants; and the latter, in imitation of that beauty which the Author of Nature more or less bestows on all his works. Here then we have the two leading principles of architecture, and the source of instruction in these principles. Convenience and utility, derived from a knowledge of the wants of the inhabitant; and beauty, or ornament, conferred upon the same principles as we see it in the natural world,—of different degrees, and assuming different characters. This then is the true theory of design in architecture, and will constitute the first division of the following remarks; the second division shall treat of the application of the principles of design to the different kinds of buildings, or subjects of architecture; and the third division shall contain a few remarks on execution and internal finishing.

DIVISION I.

THE THEORY OF DESIGN IN ARCHITECTURE.

CHAPTER I.

UTILITY AND CONVENIENCE.

So various are the purposes for which buildings are erected, that to treat this subject at any length would far exceed the proposed limits of this work, and would indeed be in a considerable degree superfluous; as it is a branch of knowledge the application of which to architecture is better known than most others. In contriving the internal arrangement of a house, two things require to be considered: first, The nature, magnitude, and number of the apartments or divisions; and, secondly, their connexion.

In buildings for the inferior animals, as horses, cows, &c. we commonly allow each individual a space equal to the square of its own length; in some cases more room is allowed, as in dog-kennels, poultry-houses, &c. but in every case of this class of buildings, the arrangement and connexion is perfectly simple and universally understood.

The lower classes of mankind are commonly allowed two apartments to each pair or family; in some cases, however, with additional apartments; placed either close under the ridge of the roof, as what are called garrets; or added externally, as sheds or hovels.

The middling and higher classes of mankind require a considerable number of apartments; because, having more time and wealth, they consequently can enjoy more frequently, and in a greater degree, the luxury of assembling their friends. This requires those apartments, and that arrangement and connexion, which we find in the houses of private gentlemen. This class possessing or having cultivated a taste for beauty, ornament is added to their apartments, either by elegance in the architectural finishing, or by introducing fine furniture, pictures, &c. and generally in both ways.

The highest classes have all the apartments of the middling class, but frequently on a larger scale and more richly decorated: often, too, they add other apartments, as the *gallery*, *oratory*, *wardrobe*, &c. though all these are not now necessarily confined to the prince or the peer.

These remarks are merely introduced to shew, that there can be no fixed rule for determining the limits of conveniency; for

as there is no drawing the line between the different classes of mankind, nor any fixed rate of expenditure in any of these classes; so there can be no given determinate number, kind, or size, nor any universal arrangement in the suites of apartments. The fashion of the day, therefore, and the will of the party, must be the general regulator in these things. What that fashion is at present may be known by any one who chuses to examine the plans, or visit the structures erected in this country for the last fifty years. This is a species of knowledge which every architect ought to possess: those who design for rural situations will soonest acquire it by travelling through the country.

CHAPTER II.

OF BEAUTY IN ARCHITECTURE.

As utility originates in necessity, so beauty has its origin in nature. Beauty addresses itself to the faculty of taste; in treating of which, that quality has been divided into several different kinds*: to which we must now have recourse, and try how far

* See Chapter III. page 78.

the whole, or any part of them, can be introduced in buildings, consistently with use. The *first* there mentioned is that of TRUTH, or the resemblance of one object to those of its kind; but as buildings are artificial objects, they cannot be any guide to real beauty, unless we are sure that other buildings are truly beautiful; but as they are the productions of men, it is proper, in an inquiry like the present, to doubt this.

UTILITY.—Every building is capable of this beauty, according to the purpose for which it is intended; as we have seen in the last chapter.

FITNESS.—This is one of the chief beauties of which buildings are capable. Fitness may be either real or apparent; real fitness appeals to the understanding, and is perfect when all the parts suit their respective uses; when the walls and other supports are of proper thickness and solidity to bear up the incumbent parts; and when the rooms, doors, &c. are sufficiently high for use, and the admission and passage of air. Apparent fitness requires such proportions in all these things as will please the eye. But there are no general proportions in nature which can be applied to architecture, nor any proportions discovered by architects which are applicable in every case. Thus every mason knows that the proportions which please best in a small room are totally inapplicable to one of double the size. In

both real and apparent fitness, all the parts should concur in promoting the same end, or producing a unity of effect. No part ought to appear too large for the whole; openings should not be too numerous, nor too large, as they will thus hurt both the reality and appearance of solidity. Solid parts should be placed above solid; and on the contrary, openings above openings, according to the common rule. Columns, though sufficiently strong to bear what is placed above them, should be made to appear so by giving them somewhat of that degree of thickness which we are accustomed to see in objects or materials of the same nature. Doors should bear some relation to the size of the human figure; they should not be as broad as they are high, nor appear too narrow for their height. The same remark will nearly apply to windows; for it may be observed, that there is more both of real and apparent fitness when the general form of a window is that of a parallelogram, than if they were of square, circular, or oval forms; and much more propriety in a pointed or circular top, than if the lower ends were made of either of these forms; for in this case we should instantly conceive that the bottom of the window would ill accord with the level of the floor. In the internal part of a house, every one can tell when the apartments are too long for their width, or too wide for their height; and though remarks of this kind are never meant to convey the idea of danger from insufficient strength; yet it is what the eye requires to co-

operate with the understanding, in approving the fitness of the whole. The same idea will apply in the case of comparing the size of the apartments with the windows and other things in the external appearance of the house (a matter which at present seems least of all attended to); to their magnitude when compared with each other; to the furniture, the ornaments, and indeed to every thing in a building.

Symmetry is a beauty which may be, and often is introduced into buildings of the lowest order. It is so easy to apply it, that no directions are required.

Uniformity.—Architecture is very capable of this beauty; it appears in colonnades, in ranges of windows, in projections, in towers of similar forms, and chimney tops, &c. Uniformity generally pleases more than variety in parts of a building which are always used for one purpose; as windows, doors, &c. It is not meant, however, that there should be a set form of these parts to be used in every building, but merely that one form of these parts should generally prevail wherever it is introduced: in larger buildings, this does not always hold; for as some or all of the upper floors generally contain the smallest and lowest apartments, the windows may frequently be made of a form somewhat different from the others.

Regular Uniformity, or, as it is frequently called, Regularity, is applied to a building, when all the parts intended for the same use (as, for instance, the windows,) are of the same form, and placed at the same distance from each other. Irregular uniformity, or irregularity, is when parts of the same kind are alike in shape, but not in situation; as, for example, when the distances between the windows are various.

Unity and Order are beauties alike applicable to architecture. The former refers chiefly to the style, and to the external colour of the walls; the latter to the parts in relation to each other, and to the whole.

Variety, in the general appearance, is produced by the introduction of projections of different degrees of magnitude, or of similar magnitudes placed at various distances from each other. In the outline against the sky, it is produced by the different heights of these projecting masses, by the chimnies, or by breaks in the ridge of the roof, &c.

Intricacy is effected by the shade of cornices, and the concealments occasioned by buttresses and other projections.

Harmony, in the general form, is produced by the introduc-

tion of masses and towers of different forms and sizes, and placing them at different distances from each other: in the parts, by introducing similar varieties and contrasts, as projecting, circular, or bay-windows, among common or simple forms; chimney tops of different heights and shapes, &c. In the cornices, it is effected by introducing sharp or angular, among round mouldings, as in those in the Grecian style. The great art in harmony is, to avoid discord and incongruity; the former is produced by the introduction of too violent oppositions, the latter by repeating lesser oppositions too frequently. The irregular Gothic style is much more capable of harmony than the Grecian, which is chiefly adapted for uniformity and variety. The greatest excellence in an architect is to have a delicate perception and accurate knowledge of harmony; to be able to distinguish it from variety; and to know when the one should give way to the other. In most buildings in the low styles, harmony should never be attempted, variety is sufficient; harmony destroys simplicity, which in this class of buildings ought always to be the characteristic. Nevertheless, we see this exquisite beauty attempted and prostituted in cottages, stables, and almost every other low building. The general excuse is, that the proprietor wished something uncommon; but this is no reason for deviating from simplicity. It is, in fact, the incapacity of the architect. There is a wide difference between

a rustic hut and a doric temple, between the language of a peasant and that of a philosopher; but, in all, simplicity may be the prevailing characteristic.

These different degrees of beauty refer principally to the general effects of an edifice. In the choice of parts, we may find some assistance by attending to such of the elementary qualities of matter as are applicable to buildings. Of forms, for example, we can frequently introduce the most beautiful, as *cones*, *domes*, and *circles*. We can *dispose* of these in various ways, and produce *concealment* and *intricacy*. They may be either hard, soft, rough or smooth, or clear, as in the glass of windows. *Colours* cannot be introduced in great variety in the external parts of buildings, except what is produced by the veins of the stone; but in the finishing of apartments they may. The other qualities of matter are generally inadmissible. *See Chap.* II. *of the Essay on Taste.*

CHAPTER III.

OF CHARACTERS IN ARCHITECTURE.

We have seen in the former chapter that all the beautiful combinations of forms which we find in nature may be produced in architecture. These combinations are also capable of particular expressions; as will appear evident, by just noticing, from Chap. IV. of the Essay on Taste, some of the characteristic marks by which these expressions are produced.

Thus Grandeur and Sublimity are produced by greatness of dimensions, succession, and uniformity of parts, &c. of which buildings are perfectly capable.

Beauty is characterized by delicacy, the prevalence of circular forms, and smoothness of surface, which, to a certain degree, are also capable of being produced.

Picturesque Beauty is characterized by roughness and irregularity, &c. which can easily be produced both in the outline of the mass, and the surface of the materials.

ANTIQUE BEAUTY is easily produced, by copying either the exact form and distribution, or the style of the ancient edifices of Greece or Rome.

MELANCHOLY may be produced by the absence of clearness, intricacy, and harmony; as in a building with few windows, and those also smaller than usual and irregularly placed: this we sometimes see in old castles, and also in hospitals.

In like manner, the GAY, the ROMANTIC, the WILD, &c. may be produced, by attending to the characteristics which produce those expressions.

CHAPTER IV.

OF THE MANNER OR STYLE OF EXECUTION IN ARCHITECTURE.

ON a very slight reflection, it will appear, that the beauties of combinations and characters mentioned in the preceding chapters may be effected or produced by different kinds of materials, or by different modifications of the same material. Thus a simple building may be erected either of clay, wood, or stone, or of all of these together; or it may have its general form

round or oblong, and its windows either round or square, or broad or narrow, and still retain the beauty of uniformity and the character of simplicity. In the same way, a colonnade, perhaps confessedly sublime, may be composed either of square, circular, angular, or clustered columns, and nevertheless retain its regular uniformity in each of the figures of the columns. The same remarks will apply to every character and to every part of a building: thus one cathedral may be sublime, with clustered columns, painted windows, buttresses, and conical towers or spires; and another equally so, with round columns, circular topped windows, colonnades, and circular domes or cupolas. This different way or manner of producing the same effect, is what is called STYLE in architecture. There may, therefore, be many different styles; and it is natural to think, that every country would originally produce one of its own, according to the materials with which it most abounded. Be that as it may, there are now two styles which in Europe prevail over all others, and which are well known under the names of Grecian and Gothic: the former characterized by circular columns, and openings square or circular at top; the other, by clustered columns, and openings square pointed at top.

It may be remarked farther, respecting styles in general, that as in all ages architecture would first be employed in the con-

struction of temples or churches, so in them *style* would first make its appearance, and be carried to considerable perfection before much attention was paid to the houses of individuals. It is reasonable to suppose also, that as individuals, by reason of superior riches or honours, became desirous of being lodged in better houses, the only way that would occur to the builder would be to give them something of the style of the temples, which all allowed to be the highest degree of grandeur, and which he was best acquainted with, and could best introduce or vary, as became necessary in edifices which were to be used for a different purpose. This, if it be a reasonable supposition, would have produced two distinct species of each style: the one the *original* style, used for the temples; the other, the mixed or *irregular* style, used for the dwellings of individuals. This is, in fact, the case in both Grecian and Gothic architecture. In the Grecian, the oblong temples of the ancients with a naked roof, and those of the moderns with the addition of a dome, form the first or temple style. The villas of Greece and Rome with colonnades and porticoes, form the second or irregular mansion style. In Gothic architecture, the first style is characterized by the form of a cross and a square tower, as in the ancient Gothic or Saxon style; or by the form of a cross and often a pyramidal tower, as in the Norman or modern Gothic style. The irregular, or mansion style, in this manner of architecture, is characterized by irregularity in the general mass,

concave mouldings in the parts, and frequently groined roofs internally, &c. as in the ancient villas of Great Britain, &c.

A free inquiry into these different styles will enable us to discern the characteristic properties of each; to see whether they are suitable to the purposes for which they are designed, and perhaps to discover errors and propose improvements. To trace the history of architecture in this way, would require considerable time, and would contain much uninteresting matter to the reader not curious in this science. What I shall attempt in the following remarks will be, to improve the taste of such as have already paid some general attention to the subject; or, if I dare not arrogate so much, to induce gentlemen and young architects to be guarded in their veneration of antiquity, and to think for themselves on a subject which has its foundation in nature.

CHAPTER V.

OF THE GRECIAN STYLE OF ARCHITECTURE.

It is commonly and most naturally supposed, that buildings would in the early stages of society be constructed chiefly of timber. This timber we may suppose either to be cut or divided into such shapes and sizes as would best serve the intended purpose; or we may imagine the artist to have searched in the woods and collected such small pieces as by being joined together would effect what he wanted, with a much less degree of labour than would be necessary in the other method.

The Grecian style of architecture seems to have been invented after the manufacturing in wood was known; it was certainly not matured until that art, or the art of cutting in stone, was brought to considerable perfection. This is evident from the different mouldings of the cornices and the bases and capitals of columns, which have scarcely any archetypes in nature. Had the case been otherwise, we should still have been able to distinguish a relation between most of the parts of columns, cornices, &c. and the trunks and branches of trees.

This, however, is not the case, except in the shaft of the column alone; and there, it evidently appears, they had the smooth bole of a tree in view; otherwise they would not have employed the taper form, for a perfect cylinder would have suited their purpose much better in so far as utility is concerned. The capital and base of the Grecian column are different from every thing in general nature; leaves never coming out in close clusters from the trunk of a tree, as in the Corinthian and Composite capitals; nor circular concavities and convexities, or square plinths, ever surrounding that part of the trunk of a tree which joins it with the root, or ever existing on any part between the ground and the lower branches. These things would not be worth notice, were it not to shew, that we cannot find any complete theory for the component parts of this style of architecture in the materials of nature when in a simple state. We must have recourse, therefore, to the original forms of temples, to the oldest Grecian antiquities, and to what is said on the subject by the earliest writers on architecture.

From these sources we may deduce, that the original Grecian temples (in which, as already observed, buildings would first assume their proper style,) were characterized, as to the general mass, by a length and breadth much greater than the height, and by columns and horizontal bearings or entablatures, with few arcades and arches. The columns were round and tapered,

placed upon a base, either a simple plinth or square piece of no great thickness, or one composed of several pieces, having convex, concave, or angular edges. These columns terminated in a capital, which is a small part of the column near the top, swelled out either in forms somewhat like those of the base, or in leaves, volutes, and other ornaments. These columns always supported, first, a horizontal piece of a height somewhat more than the diameter of the column, and divided into two parts, called the architrave and frieze; and, secondly, a large projection often shewing a number of angular and circular mouldings, called the cornice. From the outer edge of this cornice, rises the roof with a gradual ascent; the ridge of which forms one horizontal straight line, that reaches from one end of the edifice to the other. Imagine an oblong building one story high, having a colonnade on each of the two sides, and at the two ends having porticoes and pediments; the whole supporting a plain unconcealed roof; and you have an ancient Grecian temple. It is only to be further remarked, that the square mass inclosed by these columns contained openings, which were generally, if not always, parallelograms placed on their narrow ends, or, in common language, plain square doors and windows.

This kind of temple served every purpose of their religion, and was therefore complete as to utility. It is easy to conceive,

that the general form might be varied or improved upon, and the parts more highly ornamented. Hence circular and other forms were used in the general mass; and hence also the Corinthian and Composite capitals and cornices to the columns, with several other improvements and decorations, were introduced.

It has already been observed, that this mode of architecture was originally employed only in temples for religious worship. In process of time however, as individuals from different causes acquired riches, the particulars of this mode of building began to be applied to their houses, and hence the production of sumptuous palaces, baths, and other public buildings; which, as they required to be made of greater height than the temples, were the source, even in Greece, of an entire change in this style of architecture. In Greece, it would at first, probably, retain much of its primitive simplicity and fitness; but as this application of the art became more general, it would give rise to a numerous class of artists; among whom would be some of inferior abilities, who, it may reasonably be supposed, would misplace the noblest parts. Accordingly, we find that columns were placed in buildings where they had no real use, and thus became mere ornaments. As those columns were generally accompanied by cornices, these were also applied, and carried across walls; which, as by a fatal blow to the genius of this

style, has totally destroyed that beautiful simplicity which, as we have seen, was formerly its genuine characteristic.

But it was reserved for the Romans to complete the corruption of this style of architecture. They raised many stories above each other, and piled column above column, and stuck them upon the outsides of walls, frequently to such a height that they seemed in danger of falling. With them, columns might be applied upon every occasion, as the whim or caprice of the architect deemed fit. Sometimes these columns were merely attached to the wall (what we call *three quarter columns)*, and might occasionally be of some advantage by throwing shadows, which is still however mere ornament; but at other times they were half sunk into it, where they produced scarcely any shadow, and thus could neither be ornamental nor useful. Pilasters also, which probably were originally square columns placed in slender walls, in order to give them strength, or to support the roof, were imitated by shewing their supposed projections from the wall; a practice which in general, and particularly in all stone buildings, had so little the appearance of utility, and produced so little shade, as neither gave effect by its variety, nor fitness by its strength or apparent solidity. These remarks, which may be said to characterize the second variety of the temple style, are very applicable to most of the Roman amphitheatres, baths, and temples.

It is chiefly this corrupted style of Grecian architecture which we have copied and imported into this country; not that we did not know of the more chaste Grecian models, but that those of Rome were reckoned incomparably better * !

To this false taste we owe such huge masses of deformity and incongruity in almost all our public buildings, as will long be regretted by men of liberal sentiment, who are not biassed in their opinions by the authority of great names. As for private buildings or streets, the columns, pilasters, and pediments, &c. which are stuck on the doors of houses, shops, and ware-rooms, are contemptible and unworthy of notice.

As an apology for such incongruities, it will probably be urged, that where an ornamental or elegant edifice is desired, nothing better can be done. Columns, it may be said, are the noblest parts of architecture; and as we have seldom any thing to support with these columns, we must apply them close to the wall, that they may at least have the semblance of co-operating with it in supporting the roof. But this, though perhaps the only rational apology that can be made, will never be sufficient to satisfy men of taste, who are not deluded by the habit of seeing such buildings, and hearing that they are copied from

* See Chambers's Architecture, in which he extols the Roman style, and regrets that some should have proposed to introduce that of Greece, which he endeavours to decry and oppose.

the productions of Greece or Rome. To take a part which in one edifice is applied to the noblest purposes, and which produces an effect of light and shade, so striking as not to be surpassed by any object in nature; to take that part, and place it where it is incapable of either of these beauties, stimulates to a comparison; and the difference occasioned by the change of situation is no sooner perceived, than good taste recoils at the deformity, or spurns the heterogeneous assemblage. Let any person observe the noble effect of the portico of St. Martin's church near Charing Cross, and then pass to the front of Somerset House; and if he be at all sensible of the effect of visible objects, he must observe this difference. The same may be perceived in Edinburgh, by viewing first the portico of St. Andrew's church, or the Surgeons' Hall; and afterwards, Charlotte Square, the east side of St. Andrew's Square, or the Register Office. There is a kind of middle way, between placing columns where they are of real use, and where they are fixed in the wall, which is equally to be condemned. In this case, they are placed just so as to appear distinct and unconnected. The entablature which they support is of no use, because, projecting so little, it neither affords shelter, nor produces sufficient shadow. This mode is exemplified in the New College and Bank of Edinburgh. It is often placed where neither shelter nor shade are necessary; as in that huge mass of deformity, the Bank of England.

A similar comparison may be made between pilasters of different degrees of projection. Where they project one-third, or even one-fourth of their width, they frequently have a good effect; we are then ready to allow, that they may strengthen the wall, because they appear of a form capable of being well united with it. They also throw a considerable shadow and appear to connect the cornice with the wall, especially in low buildings, where they reach from the ground to the roof. When introduced at the corner of a *break*, they take away from the poverty of a naked angle. But when, in place of one-third, they scarcely project one-fifth, or when they are sunk into the wall entirely, and only distinguished by the form and size of the stones of which they are composed, as in the Bank of England, and other places, they are miserable substitutes either for beauty, variety, or fitness, and had much better be absent altogether.

Large pediments, which are intended to represent the ends of roofs, have been equally misplaced. In situations where they are of real or apparent fitness, they are a great beauty, by producing both variety and intricacy. They are conspicuous in almost all Grecian or Roman buildings; and as their form is easily retained by the architect, they are with him a common resource upon all occasions. They are frequently reared for no other purpose than that of varying a roof, and often stuck upon

walls and parapets where they can only distract the eye and produce incongruity. Sometimes too they are placed above each other, which is still more absurd, as it implies one roof within another.

Cornices have been equally misplaced; they indeed first banished the true genius of the Grecian architecture, by being carried across the middle of walls between each story, as may be seen in the Banqueting House. When carried along the whole length of a building, they destroy all breadth and unity of effect, except near the tops of the walls, where the eaves of the roof may be supposed to come. Cornices are excellently adapted for ornaments, or projections over windows: they have an appearance of use, by serving to keep off the rain; and by increasing the shadow thrown upon the glass they add greatly to variety and intricacy, without destroying unity. Pediments in miniature, placed over windows are allowable, when the number of these small cornices may require a contrast. As the intention of both these pediments and cornices is to defend the window from the rain and produce shade, they cannot with any propriety be introduced under porticos or colonnades; particularly when these are not higher than one story. When they include two stories, however, it may be allowable to introduce them over the lower windows; as there they serve one of the purposes for which they are used, viz. the production of shade,

which they could at no time do if placed near the top of the space under the portico. That part of the entablature called the frieze, when carried round windows, and terminated at top by a cornice, has a good effect; it takes away from the poverty, or too great simplicity, of angles, which always injure the effect of elegant edifices. For this reason, it should be introduced into all buildings above the rank of cottages, except those of the gloomy sort, as jails, &c. Its excellent effect in streets cannot be better displayed than in the Bank Buildings opposite the front of the Bank of England, and in some parts of Prince's Street, Edinburgh. In all buildings that have any pretensions to elegance, or any character uniting beauty with use, naked angles, or, as a mechanic would express it, plan finishing of corners, ought as much as possible to be avoided, either by bold pilasters, projecting stones, or double angles*.—Angles in recesses, in the external parts of edifices, should not be made double, because that would clog them up and give them a heavy appearance. But in all apartments finished with pilasters or columns, or any similar projections, as halls generally are, the angles should also be doubled, by placing in them either columns or parts of pilasters, as at the hall of Harewood. In some varieties of Gothic architecture, a slen-

*. The term double angles may be explained, by observing, that they appear as if a square slice had been cut out of each prominent or projecting corner from the top to the ground.

der circular column has been placed in the angles of recesses, which has a good effect in that style; but in Grecian architecture would be so inconsistent with fitness, that it would displease, as may be seen in the otherwise handsome edifice of Thrikleby Hall. It may be observed here, that the general idea of doubling the angles of corners is equally applicable to open courts and public squares; and though this, as far as I know, has never been done with the intention of producing beauty, yet the very excellent effect which it would have, may be seen in Finsbury Square, London; where the junction of two streets at two of its angles shews nearly what I propose.

The next part that appears to me censurable in the irregular Grecian style is the management of chimney tops. Nothing, in an elegant building, can be more incongruous and vulgar than the appearance of these among antique forms, and terminated as they commonly are by brown or red earthen tubes. This may be seen almost every where; but two glaring instances which occur to me at present are, Somerset House, and the New College of Edinburgh. Nothing can be easier than to give these parts forms which shall neither disgust by their vulgarity, nor require assistance from earthen ware, or additional tubes of any kind, to facilitate the ascent of smoke.

The sky outline in our imitations of Grecian buildings is too

little attended to. The style, indeed, is ill adapted to it for two reasons; first, because it was originally used only for temples, where simplicity and grandeur prevailed in every part, but especially in the outline; and, secondly, because, as fires were less necessary in Greece and Rome than in this country, they had less opportunity of studying the effect of chimney tops in their private buildings. The genius of the true Grecian style does not admit of near so much variation of outline as the Gothic; for nothing destroys simplicity so much as an outline varied by a number of small parts. Large masses, however, may be introduced for this purpose, and with good effect, as domes, or even square masses such as were used by Sir John Vanburgh. The cubical towers, however, of that singular architect, as at King's Weston and Duncombe, only deserve praise for their general form and effect; for, in their finishing, the Grecian style is superseded by a coarse modern Gothic*. Had that architect practised in the Gothic style, or rather had he invented a distinct style of his own, he would have produced wonderful effects; but, unfortunately, most of the edifices which he has executed, though they strike at a distance, from the boldness and the irregularity of their outlines, are yet, when minutely examined, so far Grecian as to excite a comparison with that style; whence their incongruities efface in a con-

* Such as in the Queen's Palace, Windsor.

siderable degree the impression made by their general effect. This is more obvious at Castle Howard than at Blenheim, though it cannot fail to strike the minds of even common observers at both places. The simplicity and grandeur which pervade the original Grecian style sufficiently shew that it is not well adapted for private habitations, and particularly for such as are used in this country, where every apartment requires a fire-place, and consequently a chimney. It has been introduced from the love of novelty, and not from a sense of superior fitness; for the variety allowed in the Gothic style of houses prevalent in this country admits of every accommodation within, and is improved in the outline and external effect by every chimney top, tower, or deviation from regularity. This may be seen by comparing old mansions built in this style with houses built in the Grecian manner at the same period, or even at this day. Thus Condover, Ingestry, and Goggr, may be compared to Hopton House, Wentworth, and Beaumont Hall. Still, however, general rules do not apply universally; for in Harewood Hall the character of the Grecian style is preserved in the external appearance; and in the internal arrangement, convenience and elegance are united, without loss of space.

The foregoing remarks refer to the Grecian style of building in general. I may now proceed to notice some varieties of that

style. These are distinguished by different degrees of proportion, or apparent fitness. They are called orders of architecture, and are divided into three sorts. The first is the *Doric;* which has massy plain columns, and few ornaments on the superincumbent parts. The second is the *Corinthian;* which has more slender columns, ornamented both on the bases and capitals, and also on the superincumbent parts. The third is the *Ionic;* which is a medium between these two extremes. Many make a variety of the Doric, which they call Tuscan; and another variety of the Corinthian, called the Composite; but these are not materially different from the others.

The proportions of these three orders apply not only to the column, but also to the general masses; to the height and breadth of all the openings, and to the projections of the cornices. There are also particular kinds of bases and entablatures adapted to each, that are of course always used in connection with their proper order. Pedestals also have been contrived for each of these orders; but the idea of using them is ridiculous in itself, and probably will not soon be revived. In every thing except these pedestals, the orders of Grecian architecture deserve to be studied, because their proportions are naturally pleasing; and also because, from prejudice, habit, and sympathy, they are become more agreeable to mankind than any others.

CHAPTER VI.

OF THE GOTHIC STYLE.

SECT. I. OF THE POINTED GOTHIC STYLE.

A VERY rational idea of the origin of this style may be formed, by supposing the artist to have chosen from thick woods such young trees as, from being crowded in their growth, had sprung up into tall slender stems with few or no branches. When he wanted a column, he did not fix on a large cylindrical tree, as the Grecian artists are supposed to have done; but collected a number of these slender trunks, placed them together, and fixed them by bandages. In this way he formed a column. These columns were never placed in the open air to support an entablature, as in the Grecian style; but always in the internal parts of the building to support the roof. For this purpose, one bandage was fixed on these rods near the ground, and another tied round them at a proper height. The rods were then spread out in every direction; and as two rows of columns were always necessary, their tops, composed of these rods, were spread out in the same manner. Their extremities, by intersect-

ing each other in the middle space between the columns, formed the smaller supports of the roof, and thus gave rise to what we call the ribs and spandrils of this style of architecture. A somewhat similar mode of procedure may be supposed to have been adopted in forming the windows and doors. First, the proposed width being marked out, two clusters of poles were fixed in the ground or wall, which constituted the sides. These were preserved perpendicular to the proper height, and there all bent in one cluster towards the center of the window, forming a parallelogram with a pointed top, exactly as we see both in the forms and round mouldings of the Gothic doors and windows of cathedrals. In the windows they proceeded further. As the space was to be filled up in such a manner as to retain apertures for the passage of light, or in order to contain the glass, they parted the base of it into a convenient number of divisions. In each of these they fixed a rod, or stem of a young tree; which they either carried straight up until it intersected the pointed arch at top, or bent it, when at the height of the perpendicular sides of the windows. In bending these poles, they sometimes only made them intersect each other and form angular compartments of one general figure: but as they were commonly smaller, and more easily managed than those of the columns, they frequently indulged their fancy in bending them, and produced either openings of different sizes, or imitated known figures of leaves, or of some artificial contrivance,

as the cross, the circle, the triangle, &c. This we may observe in most cathedral windows.

It is not asserted, that this was the origin of the pointed style of Grecian architecture; it is merely mentioned to shew the prevalence of *uniformity* in its parts: and in general it may be observed, that there are none of these parts, nor any mouldings or subdivisions of tracery, but may be referred to circular poles or stems of young trees; and let me add farther, that were there more intricacy or more contrasts in the columns, their character would be materially injured by the consequent harmony in place of simple variety; the eye would be too much fixed, and the mind prevented from conceiving with sufficient facility the essential idea of roundness. From this, and a number of other arguments which might be produced, the theory which I have suggested may serve as a good general guide, whether in design, or in guarding against innovation in this style, under the idea of improvements in the general forms, or in the composition of mouldings. Errors of the latter kind are common; an example of which must strike a critic in Gothic architecture in the recent alterations of Hereford Cathedral. In an altar-skreen in that of York also are introduced Gothic battlements! which have not the least connexion with the internal finishing of cathedrals, especially when of so large a size as is there used: it destroys all unity of effect, and pro-

duces such a violent contrast, as I should think would disgust even ordinary observers.

The external appearance of a church in this style is considerably different from the internal. It is characterized by buttresses*, either solid masses connected with the wall, or distinct masses joined to the wall by segments of arches, and then called flying buttresses. They are placed at regular distances from each other, generally one between each window. They are terminated by pinnacles, or small ornamented pyramids, which have an excellent effect in varying the horizontal outline of the roof. The general grand plan is that of a cross, and the general appearance of one side of the building is oblong, with a large projection near one end, which forms part of the arms of the cross. A tower, or lantern, is usually added upon the part where the arms of the cross intersect, and occasionally also at one end. These towers are sometimes square, and terminated by battlements; at other times, conical, or pointed, and sometimes terminated by open arches in the form of the Roman tiara or Crown, as in the cathedral church of Edinburgh and St. Nicholas's in Newcastle. The buttresses, the lantern tower, and the pointed windows externally, and the clustered columns, pointed roof, and tracery internally, are sufficient characteristics

* Which are so well known as to need no description here.

of this style; and as an exact imitation of its general forms is chiefly adapted to churches, they do not require a more minute consideration here. I shall not quit this style, however, without mentioning that it is the most perfect which exists in Europe. The beauty of fitness is so prevalent, that not one part appears superfluous. All the parts of the columns as they spread seem to co-operate with each other in supporting the roof; and all the mullions, or divisions of the windows, seem to unite in dividing it into partitions of agreeable shape and conveniency*. Externally, the buttresses appear to assist, and really do assist, in supporting the wall and the roof. By an examination into the mechanical principles which pervade the whole, this fitness is no less apparent than real or necessary; so much so, indeed, that not one single buttress, and in some cases (as in the ribs of open

* That the chief source of the beauty of the spandrils of the roof is their fitness, or their apparent co-operation and connexion with the column, cannot be better illustrated, than by referring to the new Entrance Hall in Windsor Castle, where the roof is richly covered with these parts; but as they have little or no connexion with the walls, either real or apparent, the whole seems heavy, and ready to sink down. I do not know whether or not I am singular in my opinion; but when I first saw it, about two years ago, it displeased me exceedingly; and upon examining it lately, I was convinced that the want of fitness was the sole cause of my displeasure. This shews the great danger of not attending to the theory of design in architecture. The truth is, that in practice, without a constant recurrence to the first principles, artists even of the first repute are liable to err; and in my opinion, the chief errors both in Grecian and Gothic architecture have been produced by trusting to the eye and the pencil, without consulting the understanding. This practice naturally leads artists to attach a false value to parts, without sufficiently considering, that their beauty, however great, will be highly injured, if their relation to a whole be not also taken into consideration.

crowns on the tops of spires) not one single pinnacle, could be taken away without injuring that part of the fabric. Whether we regard the variety in the columns, and the intricacy of the roof from the tracery, the leaves, and other ornaments, or consider the noble perspectives of the middle and side aisles, we must be constrained to say, that the general effect of a cathedral in this style far surpasses that of any Grecian building in producing that exhilarating sublimity which is so analogous to the purpose for which they are erected. This may be *felt* by comparing the effect of Westminster Abbey, or York Cathedral, with St. Paul's. Notwithstanding this, perhaps no human productions were ever more decried than edifices in this style. Such abuse, however, is evidently from false prejudices; which have at first probably arisen, jointly from the reformation in the national religion, and the introduction of the Grecian style; and have been continued by the ignorance of writers of different classes*.

* It is truly amusing to observe the remarks of some authors upon this style; it seems to have been the common allusion of literary men whenever they wanted to convey to their readers the idea of deformity. It is no less provoking to observe modern writers endeavouring to praise it, who yet seem either totally ignorant of its beauties, or never to have seen the edifices which they recommend. Mr. Dallaway, in his Anecdotes of the Arts, mentions the abbey of Holyrood House as in the pure Gothic style, and that of Roslin as nearly equal to Westminster Abbey; when, in fact, it is almost the only Gothic chapel in Scotland that disgraces the architect. Mr. Dallaway is equally erroneous when he speaks of Gloucester Cathedral, the Banquetting House, &c. Indeed there is not a single remark on this subject in his whole work which merits confidence.

SECT. II. OF THE SAXON GOTHIC STYLE.

This variety of the Gothic may be considered as a sort of medium between the Grecian and pointed styles. The columns here are circular, and have capitals as in Grecian buildings; but they are not tapered. They are placed in rows in churches, similarly to the Gothic; but in place of spandrils, or intersecting arches, they are, most commonly, joined circularly. In the Saxon Gothic these columns are never used detached in the external parts of the building, and thence never support regular entablatures or cornices, as in the Grecian style. The windows are wide, circular at top, and placed between buttresses; the external appearance in other respects is not unlike the pointed style, with which it is commonly mingled, as in the cathedral of Durham, the abbey of Jedburgh, and others. The origin of this architecture is of a more early date than that of the pointed style; and it seems highly probable, that in their endeavours to ornament the former, they, after various attempts, produced the latter. An indication of their progress in this may be seen by examining the very old church at Dunbar, the abbey of Dunfermline, part of that of Holyrood House, then Kelso, Jedburgh, New Abbey, Glasgow, and, lastly, Melrose: or, in England, as Mr. Milner has shewn, by viewing first the subterrane-

ous apartments of Winchester Cathedral, then the church of St. Cross, next St. Mary's (both at or near Winchester), afterwards Durham Cathedral, and, lastly, Westminster Abbey. Some peculiarities which occurred in the transition from the one style to the other deserve to be mentioned; as they have not been adopted in the pointed style, though they may frequently be used in mixed buildings, for which this style is peculiarly calculated. Among these are,

1st, Long slender undiminishing columns, often under, and seldom above, six inches diameter; placed sometimes in the recess angles, at other times in the double angles made at prominent corners, and often around columns, or upon piers, either twisting round them, or carried up perpendicularly, and parallel to each other.

2dly, There is also a kind of pilaster in use, in some buildings of this sort, as at Kelso, Jedburgh, &c. that may be introduced into irregular buildings in this style with great advantage.

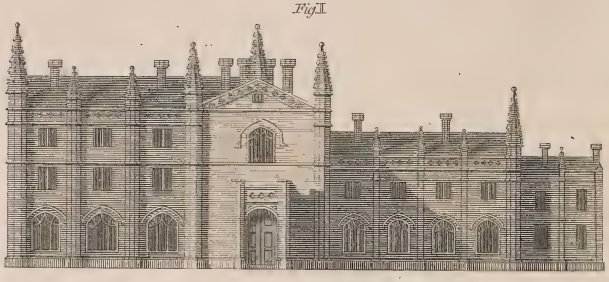
The general effect of the Saxon Gothic style is intermediate between the pointed and the Grecian. Its advantage over the latter is, that it admits of columns smaller in proportion to their height from their not being tapered; hence there is a lightness in the cathedral of Durham, which could not be effected in St. Paul's, or in any cathedral strictly Grecian.

SECT. III. OF THE IRREGULAR OR MIXED GOTHIC STYLE.

HAVING noticed the characteristic marks of the two original styles of Gothic architecture, I proceed to make some observations on the common style formed upon these, and used for mansions. The compounds which may be formed from these two styles are applicable to all kinds of public and private edifices, and are capable of supplying every internal convenience, luxury, or ornament. In towns or cities they may be raised of any height, and made perfectly symmetrical. In the country they may spread out in every direction, and be made either high or low, uniform or varied, at pleasure. It is suited to produce every expression, whether of elegance, grandeur, melancholy, or picturesque beauty, and is equally applicable to the palace and the cottage. It may produce expression by a great variety of ways: thus the expression of grandeur may be given by large masses, by the succession and uniformity of buttresses, or by the great height of towers; and again each of these styles of grandeur may be varied; the masses may be either high, cubical, or oblong; the buttresses either solid or flying; the towers either round, square, or polygonal; so that, in short, this style is capable of every variety of character and beauty. With respect to the internal arrangement, it is equally

advantageous. The symmetry and regularity of the Grecian style often occasions much loss of space, confines the size, and renders it difficult to give sufficient light to the apartments. If any error of that kind be produced in this style, the fault is entirely in the architect. But though such be the properties of this style, it does not follow that they have always been most advantageously employed; yet it may be here remarked, that where ornament in the parts was not attempted, houses in this style are generally more commodious and convenient within (taking into view the æra in which they were built), and have more unity of effect externally, than those of the irregular Grecian style. In the attempt at ornament, however, apparent fitness has frequently been lost sight of, as in many of Inigo Jones's buildings, where small columns are placed against the walls, and piled above each other, evidently for no other purpose. This is evinced in the principal doorway of that otherwise fine quadrangle Herriot's Hospital, Edinburgh, and Tixall, near Stone in Staffordshire. When the artists did not seek for an opportunity of displaying ornaments, but merely added them to such parts as were necessary, a fine effect was produced; as in the college of Glasgow, where the rows of windows placed in the eaves are terminated by ornamented triangular pediments. But even this has been carried to excess; first, by increasing the dimensions of these pediments, and then by loading them with heavy *acroteria*, as in several old houses in

Fig. 1.



Elevation of a House in the Cathedral Style.

Fig. 2.

Elevation of a House in the Castle Style.

Published May 31. 1806 by Longman, Hurst, Rees & Orme, Paternoster Row.

J. Loudon, del.t

W. Angus, sculp.

Edinburgh, and in some of the colleges of St. Andrew's. This deviation from beauty, with most other errors in architecture, shews the great danger of affecting conspicuous ornaments which have no foundation in utility or fitness. Nevertheless, it is the common mode employed by architects, and the chief resource which they have for making a house elegant, or suitable to the grandeur of the proprietor. But had the nature and use of style been attended to, this would have been done in the most striking manner, and with much less expence; as will appear evident if we apply it in the case of dress: if a lady going to an assembly dress exactly in the fashion, she can only be distinguished from others by the richness or elegance of her attire; but if she vary the style or disposition of the drapery, she will be distinguished among others in a much more striking manner; and though in dressing for assemblies, this might not be allowable in many cases, yet in buildings it is totally different; for each fashion in them continues at least an age.

The great advantages which are thus to be derived from the irregular Gothic style make it proper to mention the characteristics of a few of its varieties; and first of

The Cathedral Style.

The general masses in this style are large, of considerable length, and seldom interrupted by breaks or large projections.

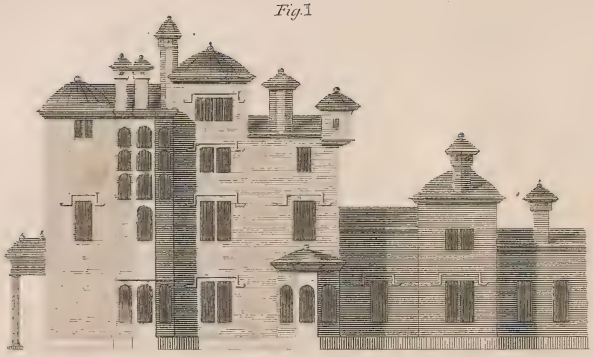
The roof is in general partly seen, and should be covered with large slates, pavement stone, grey schist, or lead: small blue slates in this style, and indeed in all large roofs, have a poor and vulgar appearance. The chimnies are generally placed in rows of angular columns often joined together at top, and known in some places by the name of cannon chimnies. The windows of the principal apartments are similar, in general design, to those of churches. When pointed at top, as is commonly the case, a buttress is placed between each. When square, and even when pointed, this appendage is frequently, but rather improperly, omitted. Sometimes a small tower is substituted in the room of these buttresses.—[See Plate I. fig. 1.]

The Castle Style.

This term chiefly refers to the battlements; for the original and proper style of edifices built for defence belongs to military architecture. The large masses are chiefly distinguished by their height, and commonly varied by breaks or towers of different forms and heights. All these towers, as well as the general masses, are terminated by battlements. The roof is generally hidden, and the chimney tops formed into small towers, or clusters of angular columns.—[See Plate I. fig. 2.]

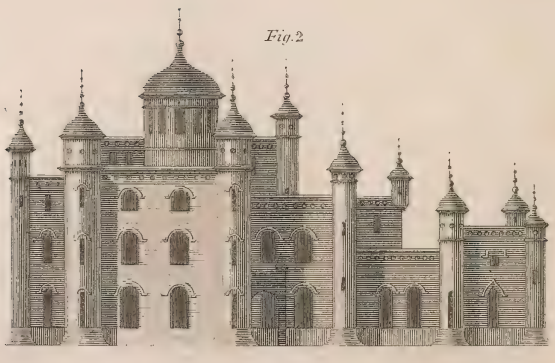
A mixed style between this and the cathedral is frequently used; either by making the house entirely in that style, or by

Fig. 1



Design for improveing the appearance of an Old House, at a small expence.

Fig. 2



Elevation of a Mansion, in the Tower Style adapted to a Romantic Situation in the immediate view of a Town or any large collection, of common Buildings.

T. Loudon. Edit.

W. Angus. sculp.

Published May 31. 1806 by Longman Hurst Rees & Orme Paternoster Row.

making the windows of the principal rooms larger, and more church-like than the others.

Quadrangular Style.

The masses are large and simple; their ground-plan commonly a quadrangle, or of the form of an H, or a quadrangle open on one side. The roof is wholly seen, except when varied by the triangular tops of windows, which are placed partly in the roof and partly in the walls, and generally terminated by pediments, or triangular tops, as in Glasgow College, already mentioned. Those of the principal apartments frequently project from the wall, forming internally small pentagonal recesses or bays from the principal apartments. The chimnies are frequently of clustered angular columns, but most commonly of vulgar shapes.

The Tower Style.

The general characteristic of this style is, that high-roofed towers prevail in the outline. These towers admit of great variety;

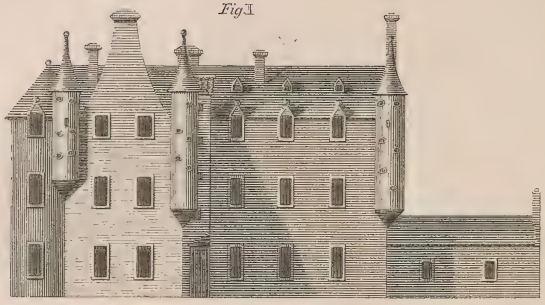
First, in the form; which may be either round, square, or polygonal.

Secondly, in the shape of the roof; which may be either conical, circular, angular, bulged, or *cyma* (ogee) like.

Thirdly, in the terminating point of this roof; which may be either a mere point, a round ball, a cross, an iron rod, or a spire supporting gilded balls or other ornaments.

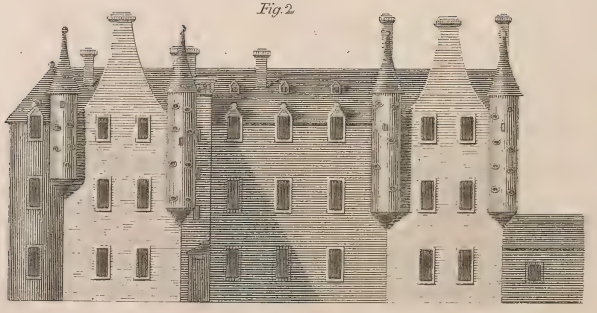
Fourthly, as to the projection of this roof over the walls, that may be of different degrees, or may not project at all, as in Herriot's Hospital; but when it does not project, the parapet should never be finished with battlements, as in Colzean Castle; it being evident that these can be of no use but when flat roofs are made. Battlements, it is true, are in this age, of no real use anywhere; but their semblance of it should not be wilfully done away in any case. The masses in this style are generally rather high than broad, and may extend in every direction as convenience shall require. The chimnies are sometimes totally concealed, and sometimes carried up singly to a considerable height; frequently two or three of these may be joined together, and then they may be terminated by a pointed top, or small iron spire, as are the towers. The windows are generally narrow, and either square or pointed at top; the general rule ought to be, to finish them in a manner analogous to the roofs of the towers, which would form a number of

Fig. 1.



Elevation of a House in a Style peculiar to Scotland & common in the Highlands

Fig. 2.



Elevation of a variety of the Turret Style common in the neighbourhood of Edinburgh.

J. Loudon, delt.

W. Angus, sculp.

Published May 31. 1806. by Longman, Hurst, Rees & Orme Paternoster Row.

pleasing varieties in the style.—[Plate II. contains two varieties of this style.]

*The Turret Style**

Is characterized by projecting turrets at most of the corners; by very high roofs both on the turrets and principal masses; by attic windows, and windows also in the eaves, terminated by triangular pediments. The windows in the turrets are few and very small, generally only *arrow* holes. The ground-plan of the whole is commonly in the form of an L. A square tower, containing the staircase, is generally placed in the angle, carried up nearly as high as the roof, and terminated by a rude ballustrade enclosing a lead roof or bastion. This style prevails chiefly in Scotland, as at Gogar, Coats, Saughton Hall, &c. In several cases an I was added to the L, forming an open square something like the quadrangular style, as at Dalry Woodhouselee and Barnton.—[See Plate III.]

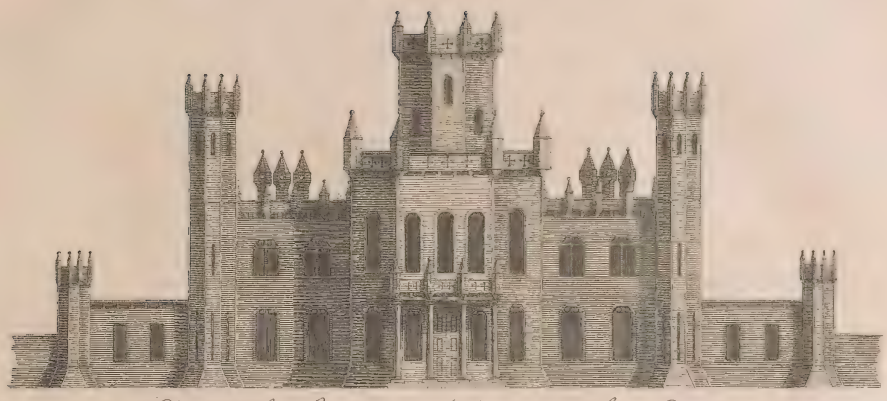
A very useful style might be formed, by occasionally adding to the tower or turret style columns; either in the Saxon form and style, or clustered; and either placed in the angles of windows, projections, or recesses, or in colonnades and porticos. [See Plate IV. fig. 1.]

* Of the picturesque effect of turrets all our novelists seem to have been fully aware; but their use or abuse should not rest solely on such representations.

New styles of considerable beauty may be formed by inventing new modes of finishing parapets, rejecting both battlements and ballustrades. Here, however, great care must be taken, not to diverge too far from customary forms; for it is not easy to get men to sympathize with innovations and new parts that have no precedent in works already existing. An example of this occurs in a plate of elevations given in Book II. of this work.

A style both characteristic and œconomical might be produced by attending chiefly to the distribution of the principal masses and the chimney tops. The roof should generally be concealed by a parapet terminated in any simple manner; the chimney tops should be mere plain masses of masonry. The windows should generally be made large, in order that there may be as few of them as possible. No false ones should be attempted, nor any placed but where they are absolutely necessary; at the same time their general forms should be alike. The walls being thus perfectly plain, considerable expence would be saved. To add intricacy and richness, train ivy and other climbing shrubs on different parts where those beauties are most desirable; as chiefly along the top of the parapet; over the windows in place of labels, and upon the chimney tops. This style would have a singular and very picturesque, or perhaps romantic effect. I have seen no example exactly con-

Fig. 1.



Elevation of a House in the Tow'r style with Saxon Columns.

Fig. 2.

Elevation of a House calculated for being decorated with Ivy & Creepers, and adapted to a particular situation, as shewn in Plate VIII.

B. Howlett sculp.

Published May 31. 1806, by Longman, Hurst, Rees & Orme, Paternoster Row.

formable to my ideas of it; but Storton Castle, Downton, and Foxley, come near it in several respects. The house being built (which will be soon done, as little or no hewn masonry would be necessary), the chief art will consist in training the creepers to proper places, leaving frequently large spaces of the wall quite naked in order to preserve breadth and contrast. Plate IV. fig. 2, represents a building of this kind newly finished, but without any creepers added to it.

To these species of style might be added a great number of others equally characteristic; but it is not necessary in a work like the present. The ingenious reader will easily conceive, from these, what is intended, and what can be done. Let me only caution the architect to preserve harmony in every style which he attempts; and indeed, in producing a new species of style, he will frequently be more certain of escaping censure by attending chiefly to variety.

CHAPTER VII.

OF STYLES COMPOSED BOTH OF GRECIAN AND GOTHIC ARCHITECTURE.

HAVING now considered the different styles of Grecian and Gothic architecture separately, a few remarks must be made on *mixing* and *blending* them in the same building.

SECTION I. OF MIXING THEM.

WHEN the style of the general masses of a building is pure Grecian, appendages in the Gothic style can never be admissible, except on the supposition that the whole has been built at different periods. Should this be the case, the general effect produced may be good; as the effect of time in producing mosses and weatherstains will serve to harmonize what would present too strong a contrast when new. It is affirmed by some, that mixtures* of this kind have a good effect in Italy;

* It cannot be doubted, that the first attempts of this nature must have been the effect of necessity, and that they were afterwards imitated from a reverence to antiquity.

the reason probably is, their being built at different times, or the two styles being impure, as we see in many Italian designs, and also in several houses in England. Allerton is partly in the Gothic and partly in the Grecian style; which happened from some alterations that were begun several years ago and never finished. Both the styles in that building are impure, and would not have been strikingly incongruous even when first built; now the whole edifice is so covered with lichens, that it presents one harmonious and singular mass; which seen from one view appears nearly in the Grecian style, and from another nearly in the quadrangular Gothic manner.

SECT. II. OF BLENDING OR COMPOUNDING THE GRECIAN AND GOTHIC IN THE SAME MASS.

To unite in the same mass forms so opposite as those which characterise Grecian and Gothic architecture, may justly be thought so ridiculous as never to have been attempted. Windows, or openings, are the most striking parts in the walls of buildings. They are all for the same use; and we are led to imagine, from the productions of nature, that they should in the same building be all of the like figure. At any rate, we are sure that when uniformity of figure is deviated from, it is ex-

pressly for the purpose of producing variety. This being the case, the mind is much more fastidious about these forms and variations, than if their uses were less known or more diversified. If variety be produced by giving the central window of a plain front, or those of the two extremities, a round top; or if there be projections, the windows in each of them may sometimes deviate from the central form, and assume perhaps the Venetian shape, without offending. But if round topped or Venetian shapes were alternately introduced among the common forms, the incongruity would at once be felt by every spectator. Still, however, this is Grecian architecture. Imagine the operation carried on further, and every second circular topped window made pointed in the Gothic manner, and certainly nothing can be more ridiculously incongruous.

It is not meant to be insinuated, that this has actually been done in every case; it is only intended to explain, to those who have not reflected on harmony in buildings, how the mixtures of Grecian and Gothic which we see in numbers of buildings must affect men of taste. In some of these buildings the windows are mixed much in the style mentioned above*; in others, the incongruities extend chiefly to the general masses. Thus in some places the Grecian proportions have been given

* As in Airthrie Castle.

to Gothic topped windows; and Venetian windows have been terminated and finished by mouldings and labels, in the Gothic manner. All distinction between the mouldings of each have been confounded; and in the roof, domes, towers, and pediments, terminated by monkish crosses or gilded balls, and surrounded by battlements or ballustrades, have been crowded together, to the entire destruction of that principle which constitutes the essential excellence of architecture—harmony. Some of the best situations and finest scenery in Scotland were some years ago disgraced by buildings of this kind; and the irrational admiration paid to the eminent artist who introduced them has rendered this style so much the fashion in that country, as to exclude almost every other. Sooner or later, however, those gentlemen who erect these productions will discover their mistake; though it will not be until so many have been erected, as will make posterity regret the taste of their ancestors.

The artist who introduced this mode of architecture enjoyed all the advantages of education, fortune, travel, and friends; and it is truly humbling to human nature, to think that he should have so far deviated from good taste. Some errors of architects are pardonable, as having been copied from those productions of antiquity which ought always to be examined with care, and which every one reveres. But this error pro-

ceeds from ignorance of principles; for who, knowing the difference between harmony and incongruity, would ever have proposed to unite in one object such a diversity of contrary qualities? Though it be possible for a person to overcome the prejudices of mankind, by uniting similar qualities in one view, which we had ever been accustomed to see separate, and which is no inconsiderable victory; yet when these qualities are of different kinds, and when, in addition to prejudices, there are inherent principles of human nature adverse to the union, it is folly and madness to attempt it. Had that most respectable artist attended to this, he never would have produced Airthrie Castle, Malsley, or Colzean, nor any of his other buildings in this style.

It is with no small reluctance that I make these remarks upon the practice of an artist, whose friends I respect both for their rank and merits; but the laws of taste and the *amor patriæ* require it. Such productions coming from a high authority impose upon mankind, and diffuse their baneful influence among other artists. This, as already observed, it has unfortunately effected in that country. In future, I hope that either private gentlemen intending to build, or artists who propose to design in this style, will, before they proceed, reflect upon the general principles of taste, and particularly upon FITNESS, UNIFORMITY, VARIETY, and HARMONY.

DIVISION II.

THE APPLICATION OF THE PRINCIPLES OF DESIGN TO THE DIFFERENT SUBJECTS OF ARCHITECTURE.

CHAPTER I.

OF PUBLIC BUILDINGS.

We have now taken a general view of those fundamental principles of architecture which, if understood, are sufficient to guide an artist in every possible case. As a further illustration of them, I proceed to make some remarks on their application to some of the different subjects of architecture which most generally come under the practice of a rural designer. All the subjects of architecture may be included under the two general divisions of public and private buildings. Public buildings include churches, theatres, prisons, senate houses, hospitals, bridges, &c. But, excepting churches and bridges, few of these are built by country gentlemen, and therefore do not come under notice in this work.

SECTION I. OF CHURCHES.

The expression of a church ought, in every case, to be sublimity; and there are two ways in which this may be accomplished. 1st, A form should be fixed upon which is suited to produce this emotion. And 2dly, The general masses of this form should in no situation be altered, though their magnitude may differ: the reason for preserving the form always the same is, chiefly, that in some cases, where the sublime cannot be produced by magnitude, from the limited extent of the building, the form, though of less size, may, from association of ideas, produce this effect. Taking a medium between the cathedrals and the simplest Gothic churches, they may be said to contain two parts: the body, which is generally an oblong mass, extending over the surface; and the spire, which is either a tapered mass placed upon its base, or a parallelogram placed upon one end. Now these general characteristics of a church should never be deviated from when sufficient expence can be afforded; and if simplicity in forming these parts be attended to, a case can hardly occur where both the tower (or spire) and body may not be erected. When this is not the case, churches will dwindle into mere barns, as is the case with a number of the country churches in Scotland and Wales; or when it is over-

done, and new forms are introduced, it will convey the idea of some other edifices; of a play-house perhaps, as does the church of St. Chad's, Shrewsbury; of manufactories, as do several meeting-houses in London; or it may present such a form as will perplex most people, as St. George's Chapel, Edinburgh, which by its ornaments and singular form excites curiosity and totally destroys the sublime.

Spires may be erected at much less expence than they commonly amount to, owing to the superfluous introduction of columns, cornices, and projections, in place of simplicity, which should pervade them throughout. In London there are numerous spires composed of parts taken from Grecian architecture, and piled up at an immense expence. Let me ask the unprejudiced observer who has seen that of St. Andrew's, Edinburgh, which, though after the Grecian manner, contains little or no ornament, whether there be in London any one comparable to it. There certainly is not, though that of the New Church in the Strand, which is among the best, must have required at least twenty times the sum to erect it which such a one as I allude to would cost.

Landed proprietors ought to encourage the introduction of spires into country villages, as one of the noblest ornaments of

rural scenery. They confer a degree of dignity on every thing around; their simplicity and boldness requires no exertion of the mind to comprehend their form; and their use is at once perceived; for still as they shoot up in the horizon, and meet the eye of the traveller as he passes from village to village, they convey pleasing information, and useful moral instruction. They inform us, that we still continue in a civilized country, and among men who live and think as we do; they remind us of our vows to friendship and love, of our duty to our Creator and our neighbour, and of the final scene of man on earth.

SECT. II. OF BRIDGES.

Fitness and utility must prevail in this class of building; any attempt at combining ornament, and giving it the semblance of use, is sure to be detected, and frequently will destroy greater beauties. This is exemplified in the bridges of Blackfriars and Kelso. The power and ingenuity displayed in even the rudest bridges occupy the mind and leave no room for attending to mere ornaments. When viewing large bridges, we feel all the force of the power and wisdom displayed in their execution; a small one ever so tastefully ornamented, never can

supply the deficiency. In some romantic situations, such as occur in Wales or Switzerland, the cross, a sublime emblem, has been introduced above the keystone with good effect. Perhaps niches may be introduced in some places; but in general it will be found the safest rule not to bestow designedly any ornament whatever. Among some of the noblest bridges in this island is that of Perth: it consists of thirteen large circular arches, supported by high slender piers; the whole has no other ornament than a plain Grecian cornice, which is carried across under the parapet on a level with the surface of the road. The simplicity and elegant proportions of this bridge deserve particular attention.

CHAPTER II.

OF PRIVATE BUILDINGS.

PRIVATE buildings may be divided into, 1. Those of the labouring poor and inferior tradesmen; which may be included under cottages singly, cottages collectively or villages, towns and cities. 2. Those of the husbandmen. 3. Manufactories. —A few observations shall be added under each of these divisions.

SECTION I. OF COTTAGES.

THE wants of man in the lowest stage of society are comparatively few: they are only those of simple nature; and nature, always consistent with herself, affords obvious and simple means of resource. The part acted by the cottager in the great drama of life, though important when viewed collectively, is nevertheless, as to the operations of the individual, scarcely discernible. The first and last time that we see him is in the

field or in the highway at hard labour; when he is no longer capable of toil, he retires under the shelter of his cottage, and leaves the world as obscurely as he came into it.

But, notwithstanding these unavoidable circumstances, the importance of the labouring poor to society is too well known to be neglected in an age like the present. This is evident from the exertions of societies and individuals to increase their comforts. Humanity can never be more nobly employed. To promote this view, and at the same time to correct the vague and erroneous ideas respecting ornamented cottages, either for the poor or as rural retreats of the opulent, I shall extend the remarks on this part of the subject to a length otherwise incompatible with the general plan of this work.

The simplicity of a cottager's establishment requires but a few small apartments; and as the whole is erected for necessary use and convenience, every part is done in the simplest and most economical manner. The size and number of the apartments are first marked out on the ground: then the walls are erected, of such materials as are most convenient, without much consideration respecting their durability. The roof is put on from similar motives, and under similar circumstances, and immediately the cottager takes possession.

As different countries, or separate parts of a country, furnish different kinds of materials for erecting cottages, and as the climate and other particulars would operate upon their form, we may suppose that various forms of cottages exist in different countries according to circumstances. In Great Britain, as far as I have observed, these may be reduced to two distinct kinds, the English and the Scotch; from which, either separately or combined, all the other varieties appear to have arisen.

1. *The English Cottage.*—From the nature of this country, its general levelness, its freedom from rocks or stones, and its comparatively mild climate, we have reason to suppose that the walls of the oldest structures of this kind were originally built of clay, turf, or similar materials, strengthened by posts and cross pieces of wood, with which also the country so generally abounded. The roof was considerably elevated; as the higher it was, the pressure upon the side walls was more perpendicular, and consequently less liable to derange the materials than if it had been more lateral, which is the necessary consequence of a flatter roof. This roof was also made to project considerably over the wall, that the rain might be entirely thrown off; for it is evident, that it would have otherwise soon destroyed the adhesive qualities of such crude materials: this projection was likewise useful in keeping off the rain from the windows

and doors; so that in general it served a double purpose. Often, however, windows were made in the lower part of the gable; and though the projection extended over that part also, yet from the height of the eaves of the roof, the rain, in falling, particularly in times of wind, might be thrown inwards upon the window. To prevent this, a projection was made over it for the express purpose of keeping off the same; and as it was known to be also advantageous in preserving the wall, it was sometimes carried across the whole end or gable, as we see still practised in several places. The chimnies in this style of cottages were generally carried up singly at one or both ends of the building, commonly in the outside of the wall, and generally of a roundish shape, and terminated with a projecting coping to throw off the rain. The materials of the roof were principally wood, covered either with straw, reeds, or slate stone. Sometimes garrets were formed under it, and consequently windows were placed either in the end, in the flank or slope of the roof, or both. The form of the windows was everywhere much broader than high, both from the lowness of the side-wall, and more suitable for giving light. This required a long cover at top; but as these were made of wood, it was no disadvantage; and besides they were frequently supported in the middle by upright pieces, which served to divide them into compartments. To this general form, which included every thing relating to the personal accommodation of the cottager, he frequently,

when in possession of a cow or horse, added a small shed and other hovels to one end, or to the side; the methods of doing which are too obvious and simple to require explanation. From circumstances which it is unnecessary to recount, this kind of cottage would in time be made two stories in height. In this case, if the walls were still made of clay, the projections would be continued, and also placed over the lower windows; but as brick or stone would be often used, when this form was adopted, there would then be less reason for a projecting roof. But, from the thinness of the walls, the windows would necessarily be placed nearly even with their surface, and consequently much exposed to the weather; still, I say, projections over them became necessary, as well as over the doors. These projections, as in the other case, would sometimes be made of wood, and sometimes of slate or grey schistus; sometimes carried across the whole length of the side walls, and sometimes no farther than over the windows.

Cottages of both these kinds, formed of clay and wood, may be seen in many parts of Worcestershire, Gloucestershire, and Herefordshire. In other counties the same form exists; but the materials are either entirely bricks, or bricks with the wood in place of clay, turf, or even stone above, as at Ambleside, and several parts of Lancashire.—[See Plate V. fig. 1.]

2. *The Scots Cottage.*—The peculiar forms of these originated from the abundance of stones, the comparative scarcity of wood, and the severity of the climate. In them the walls were built thick, in order that they might contribute to warmth, and bear the weight of a flatter roof. The flat roof was preferred, both because less of that scarce article wood was requisite, and also because this form was less liable to be injured by the winds, which always prevail in naked mountainous countries. The walls in this style not being so liable to decay as in the other, the projection of the roof was comparatively small. This did not give occasion, however, to projections over the windows, because the walls being thick, the glass frame was less exposed to the weather by receding from the outer surface of the wall. The form of these windows was narrow, in order that a stone of no uncommon length might easily cover them at top; and this shape likewise better secured them from the weather. Still, however, as these cottages required as much light as the others, the windows were made proportionally deep; and this gave rise to a mode of framing and glazing different from the English; and hence also another mode of opening the glass frames for admitting air. In these long narrow windows, it is done by having the glass cases divided horizontally. In the broad low English windows, it is done by dividing them perpendicularly. In the former case, the sashes are placed in grooves, the upper one fixed and the lower one

loose: in the latter case, one or both of the frames have hinges, and open either outwards or inwards. In the Scots cottage windows, the glass is always in large square pieces fixed in wood; in the English, always in small square or rhomboidal lozenges*, glazed in lead, and fixed in an iron frame.

The chimnies in this cottage were sometimes, and most generally, carried up in the two end walls or gables; but frequently in the central wall which separated the two apartments†. In this case, the roof was sloped on all sides in the pavilion manner. The roof here, as in the other kind, was covered with the most ready materials, generally thatch and turf; in some places heath was used, as in many parts of the

* Why the lozenge or diamond form should have a preference to the square is foreign to the present inquiry.

† There is a sort of cottage common in several parts of the north, in which the chimney is a hollow cone, or pyramid, formed of wood and clay, and suspended from the gable; the fire is made in an iron grate with open ribs on all sides, and, placed under the middle of this projection, diffuses its heat on every side, while the smoke ascends the wide cone or chimney. This plan has the advantage of allowing a numerous family to sit around it, and originated from the practice of small farmers, who formerly used to live in their kitchens with their servants and the whole family. This practice is still in use in several parts of England; but it is given up in Scotland, where the agriculture is more perfect, and the farmer a much more enlightened and respectable member of society. This mode of constructing the kitchen fire-place exists only in some old cottages. Modern families are seldom or never so large as to render it necessary, and hence it deserves no particular consideration in these pages.

Highlands; in others, blue slate, as in Peebleshire; greystone slate, as in Kircudbright; or red flagstone, as in most parts of Dumfriesshire. In every case, the roof being flatter, light garrets were inadmissible; and of course windows were seldom made in the gable ends or in the sides of the roof.—[See Plate V. fig. 2.]

This cottage being peculiar to poor countries, as in those rocks and stones most generally abound, the cottagers were seldom blessed with a cow, or even pigs, and hence had no occasion to add appendages, as in the other case. Fuel and most other things were lodged under the principal roof. Happily, in all the improving counties of the north, the practice of giving cows to all the farm servants is becoming general; and the pleasing appendages which they occasion begin to appear in many of the counties south of Edinburgh. In most of the northern and western counties, however, there still exists a peculiar formality, or sense of imagined dignity, which manifests itself upon every occasion, both in the physical and moral actions of the inhabitants. They are strict and formal in their religion; and so rigid in regard to symmetry, which, in a country so very irregular, it is natural to imagine will be the most striking and generally perceived beauty, that rather than make a cottage irregular by an exterior appendage (necessary for the cow) they extend it in length, adding a gable and chimney

top; thus making the external appearance of the cowhouse and the lodging apartments exactly alike. Hence a house of this kind presents a chimney at each end, and two doors placed together in the middle. One of these doors is the entrance of the cottager, the other that of his cow. I should not have thought this circumstance worthy of notice, were it not that some respectable improvers near Edinburgh are building a number of stiff unconnected cottages of this kind for their labourers, under the name of ornamental cottages. It must be evident to every one, that whatever their form may be, they can never be so clear, fresh, and wholesome, as if the cow-house was made an appendage, with its door either in the end, or at some distance from the door to the living apartments of the peasant.—The Scots cottage, when increased in height so as to contain two stories, has still more formality than the low kind, from being of greater magnitude.

From these two styles have originated all the varieties in their general construction and distribution. In general, we find the two styles pretty distinct; but in countries which contain materials suitable for both styles, as in the borders of Wales and the north of England, or where the people from one county have migrated to another, we find them mixed or blended in various degrees. This is the case in Northumberland, Lancashire, and some parts of Stirlingshire, as at Carron.

SECT. II. OF ORNAMENTS IN COTTAGES.

After this view of the general forms and different parts of the cottage styles, as far as regards utility, I shall proceed to make some remarks on the disposition of ornaments. The use of cottages, however, is the chief source of their beauty; and from attending to this alone, arises that simplicity which is frequently so pleasing both in the manners and dress of the lowest class of society. But in regard to dress we generally find, that no sooner has the pretty milk-maid been enabled to cover her bosom with a shawl, or her hair with a straw bonnet, than she wishes to adorn her neck with beads. So it is with the labourer and his cottage; it is no sooner erected, and he comfortably lodged, than he thinks of something farther, and begins to add ornaments. These, it is true, are more generally confined to the internal parts of it, but are often applied also to the external; and especially when cottages are near the high-way, or when they are collected together in villages, through an ambition to excel in neatness and decorum.

In the English cottage of the original kind with the projecting roof, the first external ornament would be, to take chalk and whitewash the clay walls, which would have a wonderful

effect in giving them a gay appearance. The next thing in this style would be, the decorations of their little garden, and the planting of roses, or some of the smaller fruits, against the pales which inclose it. And now, proud of this little spot, he would erect a seat close under the roof and at the side of the door, on which he may sit with his children after the close of his labour, and enjoy the general effect of the whole.—[See Plate V. fig. 3.]

When the English cottage was made two stories high, the chief difference in the style of ornament would be, that in place of whitewashing the walls, he would plant fruit-trees or ornamental creepers of some sort against them, which he could not do in the case where projecting roofs were adopted.—[See Plate VI. fig. 1.]

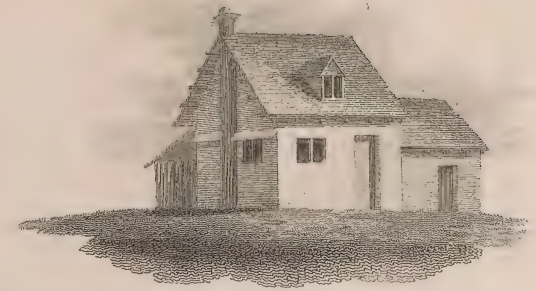
The inhabitant of the other cottage, naturally of a less gay disposition, is not profuse in whitewashing the external part of his house; he bestows a little of it however upon the edges of his windows, to indicate that all is comfortable within. He frequently places a seat near the door, as in the other style; though the difference of the climate is adverse to this luxury, and indeed the nature of the foreground, which would come immediately under his eye, is not of an inviting kind to any of the senses. Scotch cottages in a few situations, however, either

from their vicinity to another style, or from accidental circumstances in the employment of the inhabitant, are decorated with excellent effect; by training honeysuckles or ivy upon the walls, and also by adding another ornament not very general in the other style. This is a row of houseleek placed along the ridge of the roof. In a few years it becomes highly ornamental, and the stems of its flowers probably gave rise to a mode of decorating the same part in professed ornamental cottages.—[Plate V. fig. 4.]—Cottages decorated in this way may be seen in several villages near Edinburgh; but in their style there remains ample room for the interference of gentlemen, who, with little or no trouble or expence, might oblige their cottagers to plant trees in their gardens, and train creeping shrubs upon their walls; which, with the removal of an appendage in front *peculiar to that country*, and which shall be left unnamed, would contribute much to the beauty of villages, and ultimately tend to increase the health and comforts of the peasantry.

The ornaments mentioned are what would naturally be added by the inhabitant himself, and what would long constitute the sole decorations of cottages. There is another class which in a certain stage of the progress of society, the builder would introduce: thus, as the houses of rich individuals, or the churches and cathedrals of rich bodies of men, became common, artisans to construct them would become more nume-

rous; and as they could not always be employed in these great buildings, they would frequently assist those whose occupation was chiefly that of rearing buildings for the lower classes of mankind. This, from a principle of vanity inherent in man, would lead them, even in these low buildings, to imitate in some degree what they had been accustomed to in their greater works. And as the vulgar, in imitating the manners or dress of the rich, always attach themselves to the ornamental parts; so those artists, disregarding the proportions of rooms, or the principles of strength in walls or roofs, would copy such mouldings and cornices as could be applied over their doors and windows. Hence, in place of mere projections of wood or slates placed over these parts to keep off the rain, Gothic labels of hewn-stones would be substituted. Instead of plain round or square chimney tops, they would erect those clustered angular stalks which have to this day such an excellent effect in many places. [See Plate VI. fig. 2.]—These imitations were carried so far, that in many places the wood which supported the roof was carved in all the parts exposed to view; an excess of decoration that would please all, in the tasteless age in which it was executed, which is now pleasing from its age, but which we need not fear seeing soon renewed, as men of abilities equal to such work cannot be employed by the inhabitants of these buildings. It is thus, that even in matters of taste, every evil works its own remedy. In Scotland the imitation seldom went such a length,

Fig. 1



Naked English Cottage

Fig. 2

Naked Scotch Cottage

Fig. 3

Decorated English Cottage

Fig. 4

Decorated Scotch Cottage

J. Laudon delt

Published May 31 1806 by Longman, Hurst, Rees & Orme, Paternoster Row.

W. Angus sculp.

Fig. 1

An English Cottage in the second style of decoration

Fig. 2

An English Cottage in the last stage of decoration

Fig. 3

A Scotch Cottage in the last stage of decoration

Fig. 4

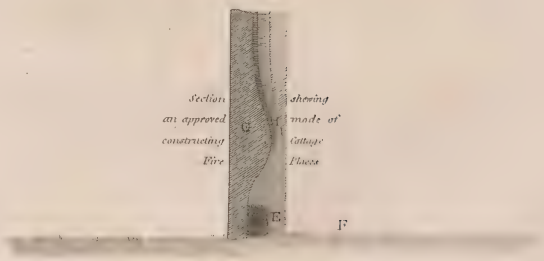
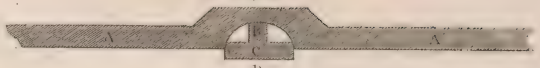


Fig. 5



D
Ground Plan

London, delt

Published May 31st 1806 by Longman, Hurst, Rees & Orme, Paternoster Row.

Westmacott sculp.

except in the towns or villages adjoining cathedrals or monasteries; and even in those places it seems, by the fatal influence of general poverty, soon to have given way to the common mode. Occasionally, however, after the introduction of ornament, the gables were finished with hewn stone in successive pieces like steps. A border or frame of stone became frequent round the windows, and slates were more generally introduced in the roofs.—[Plate VI. fig. 3.]

When Grecian architecture became fashionable, a few of its ornaments were introduced into cottages, particularly in towns and cities where stone was used, as in the suburbs of Edinburgh, Glasgow, &c. But ere this time the great passion for fine buildings that gave rise to our Gothic cathedrals was allayed; artists expert at carving on wood or stone became comparatively rare; and the fashionable style of decorating cottages seems to have been finally settled at nearly the same as that of the present day.

SECT. III. OF THE FIRE-PLACES OF COTTAGES.

It is not necessary to make any observations on the internal disposition of cottages. The best practical method for an architect to adopt is, to take the remarks of county builders or

bailiffs, and to inspect himself the general mode in use in the particular part of the country in which they are to be erected. He may then devise improvements and incorporate them with the old plan; for to alter the style of the internal disposition, or indeed of any useful part, all at once, will not often be agreeable, particularly to that class of mankind. The most important improvements are such as relate to the construction of fire-places, and the adoption of particular utensils for preparing food. Having attended to and compared most things proposed as improvements in these branches of cottage architecture, as well as made a great many experiments myself on the nature of heat*, I think that I have formed some general conclusions of considerable importance. Here I shall only advise the introduction of a mode of constructing a fire-place which will be found to throw out more heat from a given quantity of fuel than perhaps any other hitherto proposed, however intricate in their construction. It is so simple, and so similar to the general form, that I should think no cottager could find any objection to it.

Let A (Plate VI. fig. 4.) represent the ground plan of the gable or end in which the fire-place is to be erected. B the

* Some of which, relating to hot-houses, are noticed in my treatise on that subject.

fire-place, or fuel chamber, built with stone or brick on three sides, and open in front. C the ash pit, and D the floor of the house. Then suppose fig. 6. a section of this gable and chimney. E is the grate that contains the fuel, placed on a level with the surface of the floor, which is represented by F. G the solid wall, or gable, which projects completely over the fire. H the vent or funnel by which the smoke escapes.

The advantage of this plan is, that more heat is thrown out into the apartment by a given quantity of fuel. This is effected, 1st, By the lowness of the fire-place; 2dly, By the projection over it, which makes the smoke ascend very slowly, and thus gives it time to cool, or give out its heat into the room. 3dly, By having the vent at H of proper dimensions; that is, such as will neither permit more nor less than the requisite quantity of smoke and air to escape. I have generally found in like cases, that its superficial contents should be equal to that of the upper surface of the fuel chamber.

These circumstances occurred to me in the course of making experiments for heating rooms (a branch of domestic economy, which, notwithstanding the meritorious labours of Franklin and Rumford, still affords an ample field for discovery and improvement): and should they tend to benefit the labouring poor, which I think they may in a remarkable degree, if pro-

perly adapted, I shall consider the time and expence which I have bestowed upon the subject as having been well applied. At present, I shall only remark, that the supposed improvements in patent cast-metal grates, or in the fire-places of rooms, will be found much inferior to what I have here announced; observing only to make the fuel chamber rather broader than in the figures to which I have referred, where it is made nearly of a square form, for the greater convenience in holding cooking utensils.

The importance of rendering the labouring people more comfortable by increasing the conveniencies of their habitations, either in respect to the commodiousness and warmth of their cottages, the dimensions of their gardens, or giving them cows and such like advantages, appears great even at first sight: but if by these, in conjunction with other means, such a spirit could be aroused or excited in the English peasantry, as would make them sensible of the disgrace of going to a workhouse, a national benefit would be effected, which posterity only could duly appreciate. In the mean time, let me remind the humane proprietors of both countries, that it is their duty occasionally to look into the condition of this class of their dependents. A visit to their dwellings would reanimate their drooping spirits, strengthen their resolution, or prompt them to exertions: it would not occupy much time; would never be re-

membered with regret; nor would it be forgotten as a vacuum in time in which no new ideas were acquired, nor any action performed, that could afford pleasure in the remembrance.

SECT. IV. OF IMPROVED AND ORNAMENTAL COTTAGES.

From all that has been said it will appear, that I recommend no particular form or mode of construction, either for gentlemen to adopt when they erect houses for their labourers, or for such as chuse to build for their own use, what is called an ornamented cottage. The general principles and forms of parts which pervade the English style are what I particularly wish to recommend wherever an ornamented cottage is to be produced in either country. Where common use and neatness are the objects in view, an improvement upon the style of the country, whatever that may be, will generally be best, and may easily be effected everywhere by such as attend to the foregoing remarks. The materials in Scotland are ill suited to the English style, if copied exactly; for rubble work could not be formed into Gothic chimnies without considerable expence; nor could the windows with propriety be made low and broad, where they are to be covered with stones, and where the frame is to be constructed in the manner of the country. To place labels over these windows would be inconsistent with economy and

use. The glass in them being always six or eight inches within the level of the outer surface of the wall, sufficient shade is produced for beauty; and so well is it sheltered, that wood, an article much cheaper than lead, can be used for the glass frames; whereas were wood used for this purpose in the English style, it would soon be rotted by exposure to the weather. Simplicity in the design, and economy in the execution, are essential characteristics of every building in the cottage style: wherever these are lost sight of, as has been the case in almost all ornamented cottages, and even labourers' houses, built by professed architects, incongruity is a never-failing consequence. The two styles described have been blended together, and the ornaments of both bestowed with profusion. Thus we see projecting roofs, and under them labels over windows which are sunk in the wall as much as in the Scots style. In addition to this, we have these walls covered (at least as high as creepers will grow under the projection) with shrubs and trained plants. All this is useless and incongruous, and produces a degree of intricacy approaching to complexity, and totally incompatible with the simplicity of a cottage.

I pass over the modes of colouring ornamental cottages, or of imitating the effect of decay, so frequently practised in the neighbourhood of London, as altogether beneath observation. In some of them the architect is to blame; in others, the taste

of the possessor is displayed; which, as observed by Cooper in his "*Letters on Taste*," may serve to give us some idea of his mental energies.

SECT. V. OF VILLAGES.

NUMEROUS circumstances have contributed to lead the labouring class to build their cottages near each other. When agriculture was the chief employment of man, he would voluntarily adopt this mode from his natural love of society. When property became known, men would be compelled to it from various obvious causes which it is unnecessary to mention. It is sufficient for my purpose to observe, that they possessed originally a large quantity of ground, on which each might erect his cottage as he chose. Every individual thus forming his own plan, and often executing it himself, contributed to give existence to that variety in the *disposition* of these buildings, which we find in old villages, and which has been so justly admired by lovers of picturesque beauty.

In chusing out their given quantity of grounds, which we may suppose to have been part of an extensive common, all would agree in fixing upon some dry bank near a rivulet, if

such a spot could be found. In cold countries also, they would take care that it should be sheltered from the north by rising grounds or woods. Hence the *situation* is another source of picturesque beauty. And if we reflect on the garden belonging to each cottage, the fuel stack, the angular interstices in the ground formed by the irregularity with which they were placed; the trees and bushes in these places, as well as the rocks, stones, weeds, and broken ground, and finally the roads to the different cottages, and the general road through the whole village, forced to wind and turn in many different directions, we have a picturesque village; which, to render complete, we have only to people with old men digging in the garden, children in the interstices tending cows and asses, women washing clothes near the brook, and children playing up and down throughout the whole.

Artificial villages are formed in different manners:

1st, By partitioning off a quantity of ground on each side of a public road, and giving to each individual a quantity of ground more or less as may suit him, allowing him to build his house and lay out his garden as he pleases, but requiring a certain number of forest or larger fruit-trees to be grown round, or in some part or parts of his division. This I imagine to be

the best mode, as giving least trouble to either party, and in general securing variety, and picturesque effect.

2dly, To give each villager a certain quantity only, and bind him to a particular form of house; which will generally be found a bad mode: or,

3dly, The proprietor building the houses at his own expence, and letting them out to the villagers, with the obligation to preserve them in condition, under certain penalties. This mode is a good one where cottage building is not well understood, as in many parts of the highlands of Scotland.

By attending to the idea of a natural village, and to that of one built after either of the last mentioned methods, such a general plan and situation might be fixed upon as would unite beauty with utility. Unfortunately, however, most villages built by proprietors are so stiff and formal as to be entirely destructive of picturesque beauty, without exciting any idea sufficient to compensate the want of it. As such villages contain cottages generally two stories high, two families are obliged to lodge in one house; and this at once destroys the native liberty of the cottager, and probably may introduce some of the corruptions

of great towns in place of rustic innocence and simplicity*. Such villages may please from their novelty when first erected; but they deserve praise in no other respect, however laudable might be the intention of the proprietors in erecting them.

SECT. VI. OF TOWNS AND CITIES.

I MIGHT now proceed from villages to another modification both of the forms and collections of the habitations of the lower classes; but these are foreign to my purpose. I shall, however, make a few observations on the general effect and management of towns and cities, because in some cases gentlemen may have it in their power to promote their beauty or uti-

* The evils resulting from this practice have not been sufficiently attended to. Whenever a peasant can patiently suffer his neighbour to know his private penury and dependence, his native and honourable pride is extinguished, and he soon contemplates the parish-relief, not as a voluntary charity, but as a right which he claims from the community to prolong his indolent existence. In this state, the facilities of unprofitable conversation but contribute to extenuate and sanction his idleness, and the industrious respectability of his family sinks into the merited contempt of its unworthy chief. Hence one of the primary sources of rustic depravity: and it ought to be an indispensable rule with all proprietors, to prevent a too great familiarity among their villagers, and to enable them to conceal as much as possible their little domestic arrangements from the prying eye and flippant remark of their more independent neighbours. It is, perhaps, in part owing to the greater number of isolated houses, and the smaller number of villages in Britain, that the peasantry of this country are found more virtuous than that of any other in Europe.

lity; though this is commonly left to men who, of all others, are the most tasteless and extravagant.

Towns and *cities* may be ranged under the following denominations: 1st, Commercial sea-port; 2dly, Commercial inland; 3dly, University towns; 4thly, Situations for health, as sea or inland bathing towns. These different names indicate that each must have a distinct character. The first in regard to utility must have good quays, warehouses, and a harbour or river capable of containing numerous vessels. The second will be remarkable for markets, good roads, large retail shops, and manufactories. The third for fine buildings, as at Oxford, Cambridge, St. Andrew's, &c. And the fourth for beautiful streets and commodious lodgings. My remarks are intended to apply to the two last kinds; the two first being, as to general arrangement, entirely and very properly guided by the principle or necessity of utility.

1st, With regard to the direction of the streets, ornament being considered as worth attending to in these towns; those which are principal may be made in winding directions, especially if any natural circumstance favour that idea, as a river, inequalities of surface, the irregular side of a hill, or perhaps some established road already existing. A most excellent example of this kind of street may be seen at Oxford, and in

an inferior scale at Musselburgh and Prestonpans; the latter two being sea-port towns on a broken irregular shore. Sometimes different circumstances may first point out the propriety of making them straight, as on a level plain of limited extent which is to be covered with buildings. This is exemplified in the new town of Edinburgh; or on the side of a regularly sloped hill, as in the new town of Glasgow, where the streets run parallel to each other, and horizontally across the slope of the hill. When the streets are straight, they may always be varied by projections either of private houses or public edifices, as in the High-street of Edinburgh, and Holborn, in London; and whatever may be the form of the street, its beauty will always be heightened by the occurrences of such buildings as present themselves to view in the High-street of Oxford.

In cases of straight streets crossing each other at right angles, where breaks might not be advisable on account of what is now become general, *sunk areas*, porches should be placed in front of each door, reaching from the wall of the house to the pavement. The roofs of these porches should be supported either by columns or solid walls of masonry, which last would in general be more suitable with the houses of private individuals in the middling classes, and would even have an excellent effect in the best houses and streets. Porches of this kind should have a large door towards the street, and a window

on each side; and their floor within might either be level, which is the most desirable, or it might be steps ascending to the inner door. In large streets, such as Portland Place, or George's Street, Edinburgh, the appearance of large porches in succession would have a grand effect. They would at the same time, if well constructed, add to the warmth, and somewhat also to the convenience of the houses.

2dly, The character and general magnitude of buildings in towns ought to have some relation to the nature of the surface, the climate, and the surrounding country. A better illustration of the good effect which this would have cannot be given, than by referring to Edinburgh. There the old town, or original city, is built upon a high ridge of rock surrounded by a deep valley, formerly a large lake, and which on one side separates it from a level plain. Upon this plain is now built the new town, in regular streets and squares, the houses of which are all in the Grecian style, and built of a most beautiful yellow freestone. The old town, on the other hand, has only one principal street, which is conducted in a crooked direction along the top of the ridge, commencing on a plain where is built the Royal palace of Holyrood House, and after proceeding a mile up this ridge terminates abruptly with a large fort or castle built upon a rock, which on three sides rises perpendicu-

larly from the valley or lake. The houses on each side of this street are very high, but diminish as they descend toward the vallies: they are all Gothic, or at least so irregular and mixed as not in general to be denominated Grecian. They are black by age and smoke, and from the new town form a contrast which is striking and pleasing. This characteristic irregularity in form and disposition, and the black colour of the old town, the beautiful symmetry and regularity of the new, the spacious bridge thrown across the valley which connects them, and the towering hills, and romantic scenery in the immediate vicinity of the whole, renders it, as confessed by all travellers, the most beautiful city in Europe.

It will be regretted, however, by men of taste, that the magistrates of this city have contributed so much to its deformity in point of picturesque effect, that it will probably never regain its former beauty. They have clogged up and greatly destroyed the grand effect of the valley, by throwing a huge mound of earth across it, upon which they intend to build a street. The fine character and harmonious effect of the old buildings are much injured by the introduction of huge deformities of masonry, under the name of Grecian architecture. Many other absurdities they are accomplishing; and it is probable they will continue to operate until they destroy all that beauty and

character which their own tasteless souls cannot feel, and which they will not allow others to enjoy, in order to indulge the vulgar vanity of displaying the power attached to their office.

SECT. VII. OF MANUFACTORIES.

MANUFACTORIES are of various sorts; as corn-mills, forges, iron or carron works, cotton works, bleachfields, clothiers' yards, &c. This class of buildings, in general, is highly injurious to the beauty of rural scenery; as, being mostly driven by water, they are constantly placed in the most romantic parts of rivers, as on the Esk in several places between Roslin and the sea, on the Dove, at Matlock, and many other places. Forges and iron works have generally the best effect, as at Downton, Colebrookdale, Schawpark, and Carron. Corn mills driven by water are universally pleasing, particularly in romantic scenery. At Southwic and Downton they may be seen very picturesque; and at Warwick castle, a wheel which drives a corn-mill, seen from the windows of the principal apartments, operates on the mind of a stranger like enchantment. Wind machinery is sometimes pleasing at a distance, as at Yarmouth and Newcastle; but one great misfortune which attends this class of mills is, that they cannot be grouped with trees. Corn-

mills driven by water are what the rural designer may take the greatest advantage of, as will be afterwards shewn in the proper place.

SECT. VIII. OF THE HABITATION OF THE HUSBANDMAN.

Ever since agriculture became a distinct profession, the habitations of farmers must have been different from those of the other classes: 1st, As to situation; they being almost always solitary, and unconnected with either villages or towns: and 2dly, In having a number of houses or sheds for cattle, as well as ricks of corn and hay, attached to them. These grouped with a few trees, and connected with the surrounding fields by hedge-row timber, or even by hedge-rows alone, must at all times have a pleasing effect.

In these cursory remarks, it would be unnecessary to inquire into the original forms or progressive improvements in farm buildings, or to notice the various modes of arrangement in different parts of the island. There is scarcely a class of buildings in which there is less risk of erring; for if the farmer be a man of spirit who understands his business, he will be the best contriver of his own offices; and if he be not, the improve-

ments suggested by architects may make his farmery ornamental at a distance, but will never prove of any real use. The most liberal and extensive farmeries are to be found in East Lothian and Berwickshire, where there are both pasture and arable farms. There the general plan of the offices is a square surrounded on three sides by buildings; the remaining one, which generally fronts to the south, being inclosed with a wall only. At a small distance from this wall is placed the farmer's dwelling-house; from which, while sitting in his parlour, he sees every thing going on in the court and offices. On one side of the square (generally the west) appears a large conical roof, which contains the gin, or outer wheel of the thrashing machine. Around this machine is the farm-yard, which shews a number of conical and pointed ricks. The garden is commonly placed in front, or on one side of the house, which completes the general appearance; unless a few trees or straggling buildings group in with the rest, which is not often the case in these countries where every thing gives way to utility.

Very different is the English farm yard. There the whole is perfectly irregular; the farmer's dwelling-house is grouped and connected with the sheds and other offices. The large barn is the prominent building. No thrashing machine appears. The ricks are few, because the farm is generally of small extent, and the ricks are made of a longer size than in the north.

But to counterbalance these disadvantages, at least to the man of taste, the trees are most frequently large, numerous, and luxuriant. The offices too are sometimes varied by pigeon-houses and other tower-like appendages, which deserve attention where ornament is desired in this class of buildings. This may frequently be the case where they are to be erected on a residence; and often the best way of varying a dull country scene from a mansion, is to erect picturesque farm buildings.

By a practical examination of the useful and ornamental properties of these two opposite styles, as, for example, of Berwickshire and Shropshire, every intermediate variety may be constructed. The one style naturally suggests ideas for picturesque effect; the other shews where visible effect ought to give way to the necessary, or useful. The judicious contriver, if he possess a practical knowledge of farming, will form a combination uniting both qualities.

CHAPTER III.

OF THE HABITATIONS OF THE WEALTHY AND NOBLE.

These may be divided into two kinds; such as are built in towns and cities, and such as are suited to the country. The former require comparatively little consideration; and as they do not generally come under the practice of a rural designer, they must pass here unnoticed. The latter includes a number of styles and conveniencies suitable for all ranks, and combined under various designations, from the ornamented cottage to the baronial castle and royal palace. To enumerate the general names of these varieties is easy; but to detail the different accommodations introduced into each would be tedious, and could not be of half the service, either to the gentleman or architect, that visiting and examining a few of the best laid-out houses will be. The artist will find many good and numerous bad ground-plans in books; from both of which he may derive advantage, by imitating the excellencies of the one, and avoiding the errors of the other. But if he consult the situation in which he is to build, he will seldom be able to transfer to it any plan from a book or a house already executed. This mode

of copying, together with the idea of making buildings everywhere symmetrical, has been the chief source of most of those deformed clumps of masonry which shock the feelings of the tasteful traveller in all parts of the country.

The remarks which I propose to offer on this subject will be included under the following heads:

1. On choosing a situation for a country house.

2. On adapting the style of the building.

3. On uniting the mansion with the grounds, by means of the offices and other appendages.

4. Of uniting it by the offices.

5. Of uniting it by other architectural appendages, chiefly ornamental.

SECTION I. ON CHOOSING A SITUATION FOR A COUNTRY HOUSE.

In attempting this, the following particulars must be attended to: 1st, That it should be the most convenient with regard to site and situation, as they relate to the adjacent country. 2dly, That it should be the most striking that the grounds will afford; and 3dly, That the views of the surrounding country from the house should be good.

1st, With regard to the relative conveniencies of a house, the artist should have a perfect knowledge of what is wanted; and by applying every particular to the proposed spot, he will be able to judge of the propriety of fixing on it, by discovering whether some particulars are not wanting altogether, or others wanted which cannot be easily obtained. Great assistance, in some respects, may frequently be derived from houses already built in the neighbourhood of the grounds under view; particularly as to the weather, permanency of springs or rivulets, state of roads, markets, &c.: though these points and most others can generally be ascertained with very little trouble.

2dly, The next thing is, to fix upon the most striking site; which is of the utmost consequence to the effect of the edifice. Where the surface of the ground is gently varied, one of the highest of the eminences should generally be chosen, as at Leughie and Llanarth. If the surface be varied considerably, and several hills are within the given range of choice; then, if these hills slope gently, it may frequently be placed on one of their sides, as at Mountwhanny and Prinknash; or, when they are very steep, upon a gentle eminence near their base, as at North Berwick and the Holme. In some cases, where a river passes through the grounds, it may be placed on one of its banks, and always at some part of these rendered interesting either by rocks, as at Carphin and Airth; or, where these do not abound, by a bend of the river, as at Eglinton and Moccas. The margin of a lake may also be frequently chosen with good effect, as at Luss and Leven; or the rocky margin of the sea, as at Weymss Castle, Barnbugle, and Rosyth.

A great variety of other situations, commonly to be found, might be mentioned; but these may serve to explain what is meant by striking ones, as well as to shew the manner in which they may be chosen. Few things deserve more attention than this in making a place; for should the house be improperly placed at first, it is not only an enormous expence to remove it; but, supposing this done, every thing else about it is

deranged. Many are the advantages that result from placing a house in a striking situation. One of these, and which is of no small importance, is, that less expence is required in building; because a simple edifice, in a remarkable situation, strikes much more forcibly than the finest piece of architecture set down in a mere field or plain space. This might be instanced from hundreds of examples: I shall only mention two; the first is Hawthornden, built upon the summit of a prominent rock on the banks of North Esk, which though composed of the most vulgar shapes, forms a singularly picturesque scene; the second is Keddleston, one of the finest in the kingdom; but appearing as if placed in a flat grass field, it is so uninteresting, that, except for the architecture, no one would ever think of making a drawing of the scene.

Buildings in the country require much more attention, on this account, than those in towns; in the latter, they may be rendered sufficiently striking by architectural decoration; but in the former, it is not the style of the building, so much as its situation, and connexion with the surrounding scenery, that renders it picturesque. It is mortifying, however, to see the buildings that are every where erecting in spots undistinguished in either of these respects. The side of a hill, it is true, is sometimes chosen instead of the base of it; but even there a miserable taste is often displayed in neglecting some spot natu-

rally preferable to the rest. The happy art of chusing striking situations seems lost since the days when our forefathers were compelled for safety to build only on islands, isolated rocks, or otherwise almost inaccessible places. It is a lamentable fact, that in Scotland, where good and often romantic situations are so abundant that it might seem difficult to avoid them, and where several architects of considerable merit have appeared, scarcely one of these situations has been advantageously appropriated for more than a century past.

3dly, The next requisite of a good situation is, that the views toward the surrounding scenery be agreeable. The great art of accomplishing this lies in disposing the apartments properly. When symmetry is to prevail in the building, this cannot always be accomplished; but when it is irregular, which, as formerly observed, should generally be the case in the country, there can be little difficulty. By means of projections and recesses, the principal apartments may easily be contrived so as to comprehend all the chief views, and this in an appropriate manner. The breakfasting room, for example, should front a morning scene, and present somewhat of a prospect to invite to exercise during the day: the drawing-room should be so disposed as to shew the effects of the setting sun, &c. In every view, some object should appear sufficiently striking to characterize it; as a hill, a spire, &c.; for unless this be the case, it

will leave but a faint impression on the mind. The best way of accomplishing all these things is, to contrive the disposition of the apartments on the spot where it is proposed to build; then to mark out the whole, and leave it for some time; being careful, upon the review of it, to take advantage of the remarks of such persons as may have been shewn it by the proprietor. Too often, however, all these things are settled by the architect in his study, independently either of the situation, or of the general remarks of those who, though not artists, often judge better than them in matters of taste, by speaking without prejudice the feelings of the heart.

SECT. II. ON ADAPTING THE STYLE OF THE BUILDING.

To assist in this branch of the subject, we have the following considerations to attend to:

1st, The general growth of trees in the proposed situation;

2dly, The forms of particular trees which may be peculiar to it;

3dly, The general character of the surrounding scenery;

4thly, The colour of the rocks, and of the ground.

1st, With respect to the natural growth of the more common species of trees, we find that, whether single or in groups, they deviate a little in general form, and in the delicacy of their parts, according to the situation in which they are placed. Thus, in exposed places they are generally broad and low, and are more hardy, rough, and picturesque, than when covered with young shoots, which are comparatively soft, fresh, and beautiful. In rocky elevated situations, trees are much broken, or divided into parts, and distant from one another, but still appear firmly fixed to the spot; these are hardier than the others, and have much less softness and beauty. In low fertile plains, trees are generally large and erect, extending their branches on every side; the foliage is fresh and luxuriant, the general outline round, full, and flowing. If a tree be single in this situation, the balance of the branches is better preserved than in the former instance. In confined vallies between hills, trees grow high and erect, seldom broad, or sending forth extensive horizontal branches: the growth is rapid; the young shoots and foliage are tender and delicate; the trunk is comparatively slender, and the whole tree more elegant and more capable of graceful motions than in any of the former situations.

These different circumstances in the growth of trees readily suggest styles of building somewhat analogous in the general magnitude, height, and finishing. In exposed rocky situations,

where trees grow low and irregular: irregular and low edifices in the castle style may be built. In vallies, where they grow high and elegant, houses in the tower style, which implies considerable height, should generally be adopted. In extensive rich plains, buildings in the Grecian, or at least in a more massy and regular style than the others, should be chosen. This mode is certainly deserving attention, were it for no other reason than that the trees might group well with the building: that, when full grown, they might neither be too large nor too small; that they might neither diminish it into insignificance, nor leave it staring through trees, which, from want of due proportion to it, appear as copse-wood. Many instances of both these evils are to be seen in every part of the country.

Let it be observed, that this mode of fixing on the style must be attended to, though trees be not growing on the situation at the time of building. The judicious and experienced designer will examine the qualities of the soil and climate, and will thereby be enabled to judge what forms and dimensions certain kinds of trees will assume in the given situation. Neglect of this, in the naked country of North Britain, has produced several houses so buried in wood, that they cannot be seen until you are close upon them, and then they appear so diminutive, compared with every thing around, that their grandeur of effect is almost totally destroyed. This is one power-

ful argument why picturesque improvers should unite the profession of architects in so far as relates to buildings in the country.

2dly, In respect to the forms of trees peculiar to the situation, most parts of the country will produce the common trees, as oaks, elms, beeches, &c. But there are several places, however, on which it may be desirable to build, where certain species only will prosper so as to attain the magnitude of trees. Many instances of this kind occur in hilly and maritime situations. They require the particular attention of the designer, because the kinds of trees that generally suit them are so different in all respects from the common sorts, that if he were erecting a building with a view to group it with oaks and beeches, he might be grievously disappointed to find that nothing would grow near it but spiry larches, dark Scotch firs, birches, mountain ash, or perhaps only ivy and elder. This would lead to a long train of useful remarks for architects in the northern part of the island; but it is not of such general interest as to justify any thing farther in this place.

3dly, The general character of the country.—This deserves attention as much as the trees, and ought to concur in determining the style of the building. It is a common idea, that the works of art, and buildings in particular, ought to be

strong contrasts to the works of nature. Thus, when the trees are spiry, it is said that Grecian buildings, the masses of which extend chiefly in breadth, ought to be adopted; and when they are round, Gothic buildings, with towers and perpendicular lines, ought to be contrasted with them*. Upon similar principles, in romantic scenery, fine edifices of exotic architecture are introduced, with a view to contrast with the natural irregularity and wildness of the scene. These ideas arise from a superficial view of nature, and from not distinguishing between contrasts and oppositions. A little farther inquiry will convince us, that contrasts so sudden as these are not to be found in general nature. Accidental contrasts in weather, for example, are sometimes striking, as in thunder and snow; but even then, they are preceded by prognostications which prepare the mind for what is to follow. In ordinary weather, the most powerful oppositions are united, but in a manner which never occasions the smallest tendency to discord. Thus light and darkness are opposites, which are united by nature in the most harmonious manner, by the gradual appearance and decline of the sun, and by the morning and evening twilight. Strong contrasts, (either in forms or colours as in music), always produce discordant and disagreeable impressions on the mind; while harmony, which is divided from it by thin partitions, excites those grateful sensations of pleasure which are

* See REPTON's Observations on Landscape Gardening, &c.

much easier felt than described. When I see, therefore, the architecture of St. Peter's transplanted to a romantic island secluded from the rest of the world, or an outline of spiry towers and pinnacles opposed to a straight line of hill or woody scenery, I never feel such sensations. I am forcibly struck, it is true; but the emotion, though strong, is not pleasing: it soon appears discord; and discord, when prevalent, always produces disgust.

4thly, The colour of the rocks, and the ground.—Not only the general forms of the surface, but the colours of the soil and the rocks, are worth attending to, as contributing considerably to promote the principle of harmony. The tints of rocks, stones, gravel, and the soil are generally the same in one part of the country. Where they agree with the colour of the mansion, the effect must be singularly happy. This we may see from the works of painters, and in many ancient baronial castles, as well as cottages, in different parts of the country, particularly in Argyleshire and Dumfriesshire. Brick houses, when the brick has been made of an earth colour, have a good effect. By mixing proper earths when manufacturing them, they could be made of any tinge to suit with all situations. The effect of contrary colours may be seen in numerous houses of red brick, or white Portland stone, in several counties near London, which are both more or less incongruous among rural scenery; and of white-washed buildings among the rocky

scenery of Cumberland and Westmoreland. There are two cases only when the colour of the stone, if faint, may be in a great measure dispensed with, though different from the soil. The first is, in a country where no rocks appear for some distance around the edifice; the other is, in towns where rocks may appear, but where it is more economical to use a species which, though at a greater distance, or concealed from the eye under ground, is yet easier *wrought* than the other. In small villages, however, this is not allowable; as may be exemplified, by referring to the bad effect of Matlock bath, built of white stone, though placed among red rocks; and the good effect of Culross, built of the yellow rock on which it is founded, and which appears in large perpendicular masses at one end of the town.

Though the colours of edifices were made exactly the same as the ground on which they stand, or the roads which lead to them, the difference in the position of the materials, by reflecting the light in opposite ways, will always make a sufficient contrast between them. When the rock is red, black, or of any dark colour, *beautiful* architecture (that is, either Grecian or Gothic buildings, depending upon smoothness and gradation of light and shade) should not be attempted. Nature here is suggesting a variety, where the effect is produced by strong projections and bold parts, which particularly accord with the principle of fitness and economy; as dark coloured stones are

generally too hard, coarse, and brittle, to admit easily of elegant polishing or fine cornices, mouldings, or other smaller ornaments. It is a common practice to whitewash most edifices that are not built of brick or polished hewn stone. This is done either with the view of adding beauty, or preserving the walls; and often from both motives. The colour of the wash or mortar is generally, if not always, made too glaring. It must be remembered, that in mineral substances exposed to the air, a pure colour, either white or yellow, is never seen. Even chalk and marble, in that situation, in a short time acquire a dusky hue; and in their native quarries or precipices are often so grey as with difficulty to be recognized for these substances. Even the reddest rock never presents such a deep colour as at the moment when it is cut, but is soon rendered of a greyish or blueish hue by the weather. Hence, in whitewashing buildings, the same general idea should be adopted as was recommended for choosing the colour of the stones; with this addition, that the aerial tint which, in using stone, is only gained by time, may here be produced at once, by mixing powdered charcoal, bistre, ashes, or similar substances, with the prevailing colours. It may be remarked here, that in the internal parts of buildings we admire the colours pure and true to their kinds, without any mixture of aerial tint. This is because such colouring is agreeable to nature. For the same reason, we generally prefer light colours in the apartments of houses,

except in white and black. The reason is, that most objects of other colours externally have their internal parts lightest; as in the greens, blues, and yellows of vegetables. White and black objects, and sometimes red ones, are generally darker internally than on their outer surface. The two last, dark red and black, are more rare in nature than the others; and hence we admit them more sparingly in internal finishing, or indeed in ornament in general.

In concluding this section, let me caution the reader against carrying into the extreme these, or any other ideas which have been suggested, in opposition to general practice. When the expression of gaiety, or striking beauty, is desirable, no reasons that I have suggested, from the colour of rocks or soil, are intended to hinder the production of these characters, if in general harmony with what surrounds them. One principle, taken apart, and followed out in its fullest extent, will often prove pernicious; and the developement of such a principle in a book is always liable to the wrong explanations of the captious and opinionative. In practice, it is the combination of the whole in the mind of the artist, and the full consideration of every particular connected with the case, that must guide his judgment upon every occasion. He will soon find, that there are many things that may be taken advantage of in architectural painting, or poetry, which would ill accord with real execu-

tion; and many fine speculations, even of practical men, that cannot be introduced into practice without considerable difficulty.

SECT. II. OF UNITING THE MANSION WITH THE GROUNDS BY MEANS OF THE OFFICES, OR OTHER APPENDAGES.

THE immediate vicinity of the mansion is jointly the province of ornamental gardening, picturesque improvement, and of architecture. At present, what is called landscape gardening occupies it wholly. That art is a professed attempt to restore nature and landscape. Whether this is effected, is not the business of the present inquiry. It is enough, in this place, to know that it has been the aim of all her operations near the mansion, where she has destroyed works of every kind professedly artificial, such as terraces, parapets, &c. An unprejudiced observer of the works of nature, who has discovered the general principles by which she unites her contrasts, and harmonizes her compositions, will perceive the incongruity of placing abruptly, and without the least preparation or connexion, such a strikingly artificial object as a piece of architecture among others so obviously different in every respect. In nature, we never see a hill or mountain rise abruptly from its base, but always sur-

rounded by lesser irregular hills, rocks, and detached stones. Nor in the ocean do we ever see an island that is not connected or grouped with smaller masses and scattered fragments thrown around, appearing more or less above the water. In the vegetable kingdom also, we seldom see her magnificent productions rise alone; thus a large tree in a natural state is always connected by smaller ones, or shrubs, &c. with plants and grasses, all which diverge from and group around it as their centre. Every edifice should be placed amidst scenery on the same general principles. One large mass should assume the principal part; and others, according to circumstances and the kind of edifice, should be placed around it at different distances. On a nearer approach, even appendages analogous to the small rocks in the sea, the scattered stones round rocky hills, or the thorns or brambles round large trees, should appear. This, let me observe, is a general principle applicable to every artificial production, and in particular to every edifice. If we apply it in the case of mansions, we shall find it accord in a pleasing manner. The mansion itself, or some prominent part of it, may form the principal mass; the offices the secondary ones; and the last class, those balustrades, terraces, and such like architectural appendages, partly useful and partly produced on purpose, as connecting masses. Let us first consider the larger appendages, viz. the offices, and secondly such as are chiefly ornamental.

SECT. III. OF UNITING A MANSION WITH THE SURROUNDING SCENERY BY MEANS OF THE OFFICES.

The offices of a complete country residence may be divided into three kinds: 1st, The servants' apartments, coal cellar, &c. immediately adjoining the mansion; 2dly, The stables, generally near those; and, 3dly, The farm offices, sometimes near, but most frequently at a considerable distance. The whole, according to the present fashion, are studiously concealed by trees, and therefore can have no effect in accomplishing what I propose. To bring them into view so as to form subordinate masses to the mansion, care must be taken, 1st, Not to place them upon a lower level than the mansion, but if possible on rather more elevated ground. This may occasionally be accomplished on the sides of hills, when it would give a very splendid effect to the whole. 2dly, In designing the offices, the present poverty and formal simplicity should be avoided, by carrying up parapets and towers, disguising the chimney tops, and concealing the roofs. All this ought to be in due proportion to the style of the mansion. If it be plain and simple, the offices must be still more so. If rich and magnificent, the offices should have a correspondent appearance. In every case,

the same style, beauty, and character, ought to pervade both; the degree only should be different

The towers, projections, &c. raised in offices, whether of farm buildings, stables, or such as adjoin the house, need never be useless. They may serve as granaries, store-rooms, seed-rooms, pigeon-houses, and often for sleeping apartments. The chief extra expence attending this mode will be required to raise the parapets and finishings, and to disguise the chimney tops; but as these will be finished in a style a degree inferior to that of the mansion, the expence will also be less in proportion. The expence attending this scheme, however, must be a very trifling consideration to any one about to build, and what no one would ever put in competition with the effect that will be produced.

3dly, In grouping them with trees, attention must be paid to conceal chiefly such parts as too plainly point out their use; not that they are meant to appear what they really are not, but merely to disguise their vulgarity, and give them an air of dignity and consequence analogous to the difference between the servants and horses of a farmer and those of a gentleman.

Offices and appendages to a mansion, or any other building about a place, ought always to be avowed, whatever may be

its use. They can always be so disguised or improved as not to convey disagreeable ideas, and often so as to form the happiest combinations with the surrounding scenery. The misfortune has been, that when buildings for common uses were ornamented, as it is called, nothing less was attempted than to change their character: thus barns have been deformed so as to appear like churches or ruins. Common dwelling-houses have been changed to Gothic towers, or ruins of abbeys; and commonly with such a penury of taste, as would disgust of itself, though the deceit were allowable. But no disguise of this kind ought ever to be attempted. Wretched indeed must that man's genius be, who cannot elevate common objects by any other way than making them appear what they are not. If, instead of the common practice of either concealing all kinds of offices and inferior buildings, or of disgracing them as is sometimes done, they were elevated in a manner corresponding with the mansion, the beauty of every place, and consequently of the whole country, would be increased in a degree which, though it may not be obvious to a superficial observer, will never fail to make a lasting impression on the man of taste. We have seen that every mansion has three classes of offices; now supposing each class to make an object in the general scene, independently of lesser offices, there would be (to apply arithmetic to taste) three times the present beauty in every residence, and in the country in general. This is a motive which

will have its proper influence with men of taste; but there is another, which, in deference to certain persons, I would present in connexion with it—it is economy; not that a house will cost less when this mode is adopted; but by bringing all the parts into view, a more splendid effect will be produced for a given sum.

SECT. IV. OF UNITING THE MANSION WITH THE SURROUNDING COUNTRY BY MEANS OF ARCHITECTURAL APPENDAGES, CHIEFLY ORNAMENTAL.

The great art in this branch of appendages will be, to give them an appearance of fitness; for as a house is useful as well as ornamental, so should every thing belonging to it be. But although the appendages under consideration are of less utility than the others, their appearance will not displease even those who are devoid of improved taste, unless they have been previously prejudiced against such things. Such indeed is the excellence of harmonious combination, that although it cannot force the approbation of the insensible, it will never of itself excite their displeasure. In pursuing this subject, let us trace it in two or three stages between the palace and the cottage.

1st, In common labourers' cottages.—Here the appendages of the first kind are the cowhouse, the shed: those of the second kind, the pales or rude wall which inclose the garden, the seat close by the door, and in some instances stone troughs for water, &c. These are all made for the purpose of utility by the cottager; but with the painter they are appendages which serve to connect and harmonize the whole.

2dly, The ornamented cottage.—Here the first class of appendages are not approached by the front of the dwelling-house; their doors do not appear open; but still they come in as subordinate parts, grouped by trees and shrubs, and variously concealed with honeysuckles and other creepers. In the second class the paling is made light and open; its style is simple, but yet it is enriched by roses; and, in place of inclosing a plot of cabbages from the depredations of straying cows, &c. it now incloses a parterre from the bite of sheep, which we may suppose are pastured in the paddock which contains the whole. It may also be in a still smaller spot, as is most commonly the case in the neighbourhood of towns or cities; and then, in lieu of the paling, is substituted a wall, which separates it from the public road. In place of the rude wicket, the neat yet simple gate is substituted. Sometimes it may happen, that a carriage road is made to the front of the cottage; at others, a footpath only; but still the same principle is applicable, and the same

idea is not frustrated; for common cottages have frequently cart roads which are carried close to their front.

3dly, Villas.—The lowest class of these must be supposed to be visited by carriages; consequently they have always a road to their front, and generally a portico. Frequently too they have an entrance front, and another called a garden front, which looks into the pleasure ground. Thus we have two, and often three fronts in villas, which chiefly require ornamental appendages. These fronts are plainly divided into two parts—those on the ornamented side of the house; and those on the useful or entrance side, which is generally less decorated than the other.

On the park front, or useful side, then, we require a barrier to keep off the cattle. A paling would be too mean. A wall raised on the surface would exclude the view; but one partly built in an excavation, in the manner of a sunk fence, carried up two or three feet above the surface, and finished either with a balustrade if the mansion be in the Grecian style, or with battlements if it be Gothic, or with a finish corresponding with the finish of the parapets or other parts of the mansion. Across this fence the road to the portico must pass, which will require a gate, and consequently a bridge over the excavation. Piers also will be requisite on which to hang the gate and parapets

on each side the bridge. Frequently another gate and bridge will be required, by which the carriage may pass to the stables. This is a farther source of architectural appendages. When the wall and piers are partially covered with ivy or other shrubs, and its termination, or union with some other fence, is concealed by trees, the effect will be complete for the entrance front of what we may term the first style of villas.

4thly, But a house of greater magnificence will generally be placed upon a site made, either naturally or by art, of more consequence than the one mentioned. If the general surface be flat, it may be built upon a raised platform. This will require a gradual ascent in the carriage road, from the outer wall or fence to the entrance. But, except where this road is made, the ascent should be sudden, that the site of the house may be more striking, and consequently its importance be heightened. This may produce terraces, or a variety of other appendages, as in Plate VII. fig. 1.

5thly, In addition to the above, a magnificent villa may have a rampart, as an ascent for carriages to the portico: and this will form an interesting source of grandeur, use, and beauty. Plate VII. fig. 2, was designed for a situation in a fertile country near the sea. The entrance front, which is here given, is to the north east, and of course admits of little ornament, as

Fig. 1. Intended to shew the effect or harmonizing a Castle-Gothic-mansion, with the surrounding scenery, by means of the Offices - Gateway - Terrace wall, & such like architectural appendages.

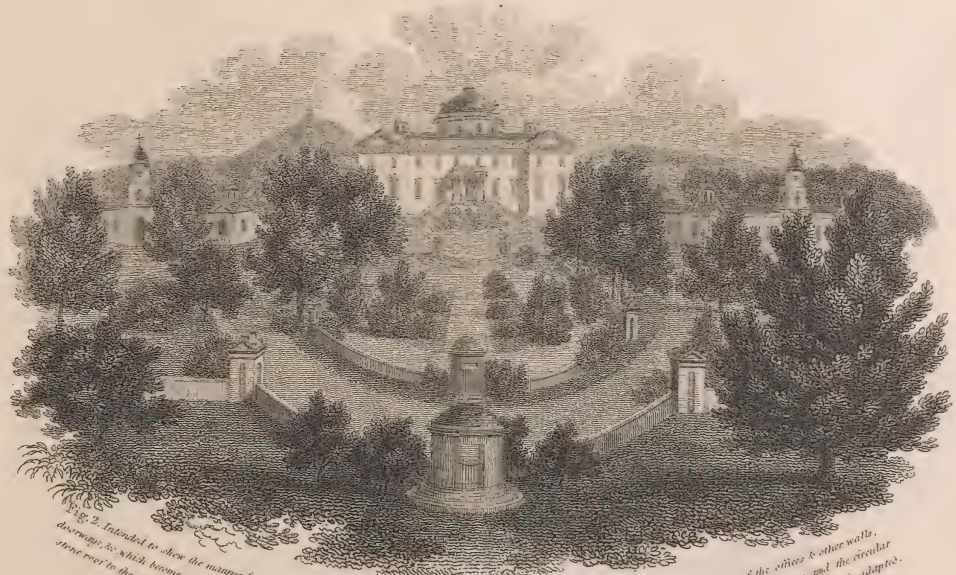


Fig. 2. Intended to shew the manner (rather than the effect) of harmonizing a Grecian building with the surrounding scenery, by means of the offices & other walls, doorways, &c which become necessary as well as ornamental. — The Dome of the mansion — the Temple on the distant hill — the cupolas on the offices, and the circular stone roof to the gateway in the foreground, are intended to give the whole a classical appearance, analogous to the rich & noble country for which this design is adapted.

J. Loudon del.

Howlett sculp.

Published May 1st 1807 by Orme, Longman, Brown, Hurst, Rees & Orme, Paternoster Row.

J. Loudon del. J. Greig sculp.

Fig 2. of Pl. 4. put in perspective & adapted to its situation.

This building contrasted with its elevation in Pl. 4. may shew the great difference between designing for mere geometrical effect & designing for situation, character & picturesque beauty.

Published May 1st 1808 by Longman Hurst Rees & Orme Paternoster Row.

the absence of the sun during the greater part of the day would prevent it from having its full effect. Symmetry is preserved in the offices, as in unison with the style and the ground, and also in this case strictly connected with utility. The roof is covered with large slate, and is shewn, not only as agreeable to Grecian architecture, but also that it may catch and shew light when the walls of this front are under shade. The whole unites great convenience, and will produce in its situation a splendid general effect. These remarks will give some idea of appendages which may be placed at the entrance or park front of a mansion in a level or plain situation. Where an irregular one occurs, an endless variety of similar appendages or parts will most readily be suggested by the inequality of the ground, the irregularity of the house, and other circumstances. See Plate VIII. which is intended to shew the effect that such a house as fig. 2. Plate IV. will have, when adapted to the ground, and when it has been erected four or five years, so as to be varied by quick growing creepers. See also, Plates XIV. XXVI. and XXVIII.

The kind of appendages which connect the garden or ornamental front are next to be taken notice of. As already observed, these are professedly ornamental; and consequently obvious utility will be in a great degree dispensed with; especially if the effect be good. If displeasing, however, we natu-

rally call in question the use of the parts which gave rise to it, or of which it is composed.

1st, In the first or lowest style of villas, steps may descend from the door of the garden front into a gravel walk, broad and of a fine surface, and separated from the lawn by a parapet of hewn stone six inches or a foot high; upon which, at regular distances, are placed stone flower-pots, or vases containing plants or ornamental shrubs. The direction of this low ornamented parapet should bear a relation to the projections or recesses in the ichnography of the mansion; the extremities should be concealed by shrubs, or any easy contrivance, such as a seat, a few steps, or by numerous other ways.

2dly, In the next kind, in place of this low parapet may be erected an elegant balustrade with antique urns placed at regular distances; flowering plants and shrubs may be planted close by the balustrade on the lawn side, which will grow up and intermingle with the balustrade, and twine round these urns. In place of a broad gravel road, let it be neatly paved with flagstone, on which may be set stone pots of plants in parallel rows, &c.

3dly, In addition to this plan, may be given jet-d'eaus or fountains of different kinds, according to the situation, whether

cheerful, grand, or melancholy; and they may be connected in different ways with the paved walk and balustrade.

4thly, The last addition to these appendages may be statues; which, in my opinion, should never be placed far distant from the house, as is done in the French gardens, and in several places in England, as at Castle Howard, Bramham Park, &c. Artificial water-works should be used under the same regulations, and not scattered up and down every where as at Chatsworth and Studley, &c. But on both these subjects more will be added in their proper places.

In order to give the clearest view of my ideas on this subject, I have considered it in relation to two different fronts. But there ought to be no limitation of either the number of fronts or degree of ornament in them. Sometimes the entrance front may be the most highly ornamented; at other times, only one side of a building may be seen, the other may overhang a precipice, &c.: in fact, there are innumerable ways in which a mansion may appear, without coming under the two divisions treated of. But these are sufficient to convey my general ideas on the subject; and if they are understood by the artist, he will adopt schemes suitable to every situation and mansion, whether in the Grecian or Gothic style, much better by viewing them, than by any further detail.

The next way of uniting a mansion with the surrounding scenery is by wood; 1st, The general masses by large trees, of forms different, but not totally opposite to those of the house, &c.; 2dly, The lesser appendages by shrubs and plants; and, 3dly, By creepers, ivy, &c. trained on different parts of the masses, as well as on the appendages. But as planting is not an operation of architecture, it does not come under our discussion here.—*See* PLANTING.

DIVISION III.

OF EXECUTION AND FINISHING.

THIS is included under masonry, carpentry, plastering, painting, glazing, &c. which are not necessarily connected with my intention in this work. The most important points to attend to in masonry are, the foundation, the quality of the materials, and the formation of mortar. Mortar, as the principles of chemistry and the practice of the best architects shew, ought never to be soured or mellowed as is commonly done, particularly in the North: See Dr. Anderson's Essays on Limestone, Higgins's ditto, Irwin's (of Glasgow) works on Chemistry, lately published; and see also a Paper in the Farmer's Magazine for 1805.

It only remains for me, in concluding these remarks on Architecture, to reply to an objection sometimes, and with an appearance of justice, made against the idea of those who lay out grounds combining that profession with architecture; be-

cause, say the objectors, the division of arts and labour is the way to perfection, and not their combination. My reply is, that rural designers combine only the practice of one branch of it, viz. that which relates to country buildings; and even in them it is chiefly confined to design; the executive part must always be done by a builder or inferior architect, and generally inspected by the proper persons who are appointed for the purpose. In this branch then the picturesque improver, or, as I rather choose to call such, on account of his combining this profession, the DESIGNER, does every thing that is done by architects. Small buildings in the country, as cottages, farm buildings, &c. are generally both designed and executed by the masons or builders of the place; and when their employer is poor, they abide by utility, and seldom disgust if they do not gratify taste; but when they have the least power of bestowing ornament, they are sure to present hideous productions, which I could exemplify from every part of the island. City builders also near London (where it is carried to the greatest length) erect the most absurd combinations under the name of cottages. Architects in the capital are laudably endeavouring to overcome this evil by publishing. Hence some have gone to the remote parts of the country, chosen the most vulgar and disgusting forms, and published them with a view to correct the prevailing taste. Others have not travelled so far, but chiefly in their closets have combined all sorts of forms and parts of architecture, whether from

castles or temples, under the idea of improving the taste in cottages by introducing something classical. Neither of these kinds of cottages, it is to be hoped, will ever become general. True taste in this branch of architecture is to be formed, and ever must be formed, from cottages already erected in the county; from considering their various forms and combinations, and their origin; and from being able to distinguish between that wretched poverty of form which is the result of necessity, and the more pleasing simplicity which is the result of contentment and sufficiency. This is neither to be accomplished by partial views of the county, nor by the study of the five orders and their combinations. This remark on cottages, and other inferior rural buildings, is equally applicable to villas, castles, and mansions; which, as being more striking objects, and erected by such as can bestow more money, the mere architect can indulge himself in drawing more lines, producing longer elevations, and finer columns and rotundos; but which, when erected, only strike the discerning traveller with more force, and raise his mind from feelings of displeasure to sentiments of disgust. I do not hesitate to say, that this will ever be the case, until architects shall consider rural buildings, and those in towns, as two distinct branches of their profession, and which ought to be followed by different professors: and I add, that the professors of the rural style must cease to consider the buildings of

Greece and Rome as models of perfection*, and must study equally with architecture the character of landscape, the nature of its materials, and the principles of its composition. This points out the necessity of what I propose,—the uniting the profession of rural architect with picturesque improver; and at the same time, to every candid mind, it will be a complete justification of the innovation proposed; which will, no doubt, be disputed and rejected by a certain class of men. There are some architects, however, with whom I have the pleasure of being acquainted, that justify these arguments both by their consent of opinion and their example in practice.

* "The antique is to the architect, what nature is to the painter," says Sir William Chambers; and

"Learn for ancient rules a just esteem,
"To copy nature is to copy them,"

says Pope; but both are equally wrong. A too great reverence for antiquity, and dependence upon rules, have ever been the most fatal adversaries to improvement. None of these can deserve attention, but such as have been derived from nature; which is still the same inexhaustible fund of knowledge and improvement. Even rules derived from her laws should never be exclusively enforced, because they always tend to shackle the mind; but, to shut out nature, by imposing rules, systems, or models, in her room, is in the last degree unphilosophical and dangerous. It is evident from the best ancient edifices, that they did not adhere strictly to the same proportions of columns, though the moderns are constantly endeavouring to find out some of these proportions, as perfect standards. But such is the natural propensity in man to establish rules and systems, that even in Gothic architecture, the great superiority of which over Grecian is that it is unincumbered with artificial regulations, and consequently admits all kinds of effects, a late writer has endeavoured to discover proportions which he thinks may be applied to all the English cathedrals!! But,

"*Such formal coxcombs let us still defy;*
"*And dare be pleas'd although we know not why.*"

BOOK I.

PART IV.

AGRICULTURE.

INTRODUCTION.

HUSBANDRY, the most ancient, useful, and agreeable of arts, may be included under the following heads: 1st, Agriculture, and the management of live stock; 2dly, Planting; and, 3dly, Gardening: each of which admits of several subdivisions. The principles of husbandry are derived from nature: either by observation, or by experimental inquiry. Observation relates chiefly to a knowledge of the three kingdoms of nature, as they appear in their pristine, or uncultivated state. Experimental inquiry relates to the effects of culture, or artificial agency, on the subjects of these kingdoms, and to the mechanical powers of the implements by which culture and other purposes are effected.

THE VEGETABLE KINGDOM may be considered under the four following subdivisions; viz, 1st, General economy; 2dly, Classification and nomenclature; 3dly, Natural properties; and, 4thly, Uses.

1. The Economy and Laws of Vegetation.—This includes the physiology of vegetables; their structure and anatomy; the motion of the sap; their natural propagation; the formation of their parts, their nourishment, &c. A knowledge of this branch of botany is of the utmost importance in discovering the cause and nature of diseases; in promoting the growth, increasing the natural longevity, or augmenting such essential parts of individual vegetables as are particularly subservient to mankind.

2. The Classification or systematic Arrangement of Vegetables, and Nomenclature.—This has been effected in many different ways. Nearly all are agreed on the sevenfold divisions and names of *trees and shrubs*, *plants*, *grasses*, *ferns*, *mosses*, *fungi* or *mushrooms*, and *flags* or *sea weeds*. The system of Linnæus is at least the most useful hitherto proposed, and perhaps as complete as the number of vegetables yet discovered will admit of. Its arrangement of vegetables into twenty-four classes, and each of these into orders, genera, species, and varieties, is generally adopted, and the Linnæan nomenclature almost universally followed; it consequently deserves the particular study of

all who would acquire a knowledge of this kingdom of nature. The use of this system of natural history is extensive; it assists the memory in recollecting the qualities of vegetables, both of individuals and of general classes; it enables us to derive advantages from the writings and discoveries of authors; and, by ascertaining to what link of the system a new or unknown plant belongs, to communicate intelligibly our ideas to others.

3. The Properties of Vegetables.—By this is meant their place of growth, their natural soil, exposure, climate, longevity, time of flowering, &c. It is discovered by observation, and ought to be recorded in all complete descriptions of vegetables. It is of great utility to agriculturists, by enabling them to adopt proper modes of cultivating useful plants, or destroying pernicious ones, and also to discover the soils and plants reciprocally adapted to each other. With respect to proper modes of culture, it directs the choice of suitable agents, as soil, situation, climate, moisture, &c. It also shews the proper season of sowing or planting, reaping and renewing the crop. With regard to destroying pernicious vegetables or weeds, it teaches us, that many plants die when cut down immediately before they come into flower; that others are prevented from producing seed, and thus rendered less pernicious by this practice; that some produce and scatter their seeds in a few days after they have ceased flowering, as the *hieracium vulgaris* and *tussilago forfara*,

and consequently ought to be removed, if not previously, at least immediately after the period when they come into flower; that some vegetables send out their roots horizontally along the surface, and are easily killed by being planted too deep in the earth; as the *mentha*, *tanacetum*, and couch-grass, or *triticum repens*; that some sorts are destroyed by rendering land firm and close, as the common nettle; and others, by rendering it soft, as the common ragweed, or *hieracium*, &c.; that good plants are often produced by making land firm, as the *poa trivialis*; others by simply laying it dry, as the white clover, &c. &c.

With respect to discovering the nature of soils by the properties of plants, it can be done with greater certainty by this than by any other branch of science. Growing crops may frequently deceive; but when the natural plants or weeds are discovered, they are almost infallible indications of the nature of the soil. Mr. Kent, in his hints on landed property, has very judiciously mentioned several plants which indicate certain qualities of soil; to which any person practically acquainted with agriculture, and accustomed to make botanical excursions in the fields, might add many others; for example, in the genus *plantago*, the species *lanceolata* indicates a deep, free, or sandy loam; the *p. major* a firm good loam; the *p. coronopus*, *linearis*, *maritima*, arenarious, gravelly, and poor soils. The *tussilago petasites* near the margin of rivers is a sure

sign that they overflow their banks. The presence of the *asphodelus palustris* is generally a certain indication that the *drosera* is near, which brings on a terrible disease in cattle, and often turns their milk into blood in mossy soils. The water-lily in pools among moss or peat commonly indicates marl, or rich clay, &c. The different species of lichens upon stones indicate their firm close texture; the *bryums* and *jungermaniums* generally the contrary. The absence of all moss on stones exposed to the weather, shews that they are oxydable, that their surface crumbles off in the winter season, and consequently that they are unfit for being used in buildings.

4. The Uses of Vegetables.—These are either for supporting life, restoring health, furnishing food for animals, or being used in the arts. With respect to medical and nutritive qualities, that knowledge is acquired either by observing the daily food of cattle; or the instinct of these or other inferior animals, which often, when diseased, have recourse to certain plants that give them relief—hence the names of dog-grass, cat-mint, &c.; or by observing what effect is produced upon cattle by pastures in which particular plants prevail. In this manner Linnæus observed what took place after harvest when cows were turned upon the stubbles; and this fact is taken advantage of by such as give parsley, mint, &c. to their cows on certain occasions; or it may be also derived from actual experiment upon animals,

or by chemical decomposition, &c. Our knowledge of the uses of vegetables in the arts, whether in their juices or extracts, for dyeing or tanning, salts for bleaching, or wood for implements or architectural purposes, is acquired by various modes of comparison, observation, and inference; but more particularly by actual experiment and researches, either chemical or mechanical.

The Animal Kingdom may be similarly divided with the vegetable; viz. into 1st, The animal economy; 2dly, The classification and nomenclature of animals; 3dly, Their natural properties; and, 4thly, Their uses, or subserviency to mankind.

1st, The animal economy includes physiology, anatomy proper and comparative, digestion, circulation of the blood, generation, &c. Anatomy proper is a branch of knowledge with which every one ought to be more or less acquainted, not only because it will enable him in many cases to guard against or alleviate accidents or diseases, and especially the present dangerous systems and practices of physicians; but also as a source of philosophical reflection, and sublime contemplation. Even a very slight general knowledge of the human frame will excite our wonder and awe at the contrivance of the whole, and confirm and establish the mind in the natural sentiment of Deity. Comparative anatomy, digestion, generation, &c. are of great importance in breeding, rearing, and fattening animals, as well as in

curing their diseases. It is a branch of natural history by no means scientifically understood, especially by those practical men who most stand in need of it. A good deal may be learned with respect to the useful classes of inferior animals, by comparing what has been written on the subject, with the opinions and practices of butchers, graziers, farriers, &c. But in regard to destroying ravenous birds, and the various classes of pernicious insects and worms, (the bee and a few others excepted,) we have yet much to learn. Unless nature should effect this herself, by means of other animals, as she often does, we can rarely do any thing that will prove directly destructive, or permanently useful in such cases. The science of entomology affords a striking lesson to the moralist, and a wide field of experiment and enquiry to the philosopher.

2dly, The Classification and Nomenclature of Animals.—The classification most generally adopted is that of Linnæus, by which the animal kingdom is divided into six classes, and these into orders, genera, species, &c. as in botany. The classification and nomenclature adopted by naturalists in treating of animals are of less importance to the husbandman than those of botany, as in general the animals with which he is concerned are comparatively few, and those sufficiently well known in all civilized countries.

3dly, The natural Properties of Animals.—Necessity, experience, and perhaps ambition, have contributed to make us acquainted with most of the animal race. Many of these, besides being highly useful in husbandry, often evince an instinct which may be of considerable use in picturesque improvement. Thus in pasture abounding with *centaurea cynapium*, which cows and sheep refuse, the horse eats it greedily. In those where the common groundsel, or the perennial ragweed abounds, horses and cows refuse it, but sheep devour it readily. The *sonchus oleracius* and dandelion are passed untouched by all these; but swine eat them voraciously. When grass has been watered with salt, it will be greedily consumed by all graminivorous animals. Linnets make their nests chiefly in furze, and much more readily in the *Ulex europea*, or *Scotch furze*, than in the dwarf English whin. Their food is chiefly the seeds of the *plantago*, or those of the annual *polygonums*; which last plant affords food to most kinds of singing-birds. The thrush lives chiefly on the berries of the mountain ash; the goldfinch on those of the thistle, &c. There is such an infinite number of useful facts to be gathered from this branch of natural history, that it were endless to retail them *.

4thly, Their Uses, or Subserviency to Mankind.—This knowledge is derived from experience in the first classes, and in the

* See Linnæus, Buffon, Edwards, Pennant, Goldsmith, Berkenhout, &c.

others from experimental inquiry. From these studies we derive the knowledge of such animals as are subservient to man; of such as, though apparently useless, destroy others which would do more harm; as crows, magpies, and others, devour grubs and worms; ducks and hens slugs and caterpillars, &c. We also learn to rear the young of tender birds, or to feed others properly, by providing them with their peculiar food: thus we give ant-eggs to young turkeys, worms to fish confined in vessels, &c. Numberless useful facts might be added from such an interesting study; but these are sufficient in this place to shew its importance.

The Mineral Kingdom may be considered, 1st, under the vulgarly reputed elements of fire, water, earth, and air; and 2dly, under chemical decomposition and combination. Under the first head, extensive and useful information may be obtained respecting the application of heat, the uses of water, the diversity of soils, stones, and metals; and lastly, the weather. Under the second head considerable information may be had respecting manures—the process of vegetation, malting*, &c.

* The process of malting is purely vegetative, and consists merely in an artificial method of bringing the vegetative principle of seeds into a state of germination. This state is carried even to the length of placentation and radiation, when it is found by experience, as yet very imperfect, that the greatest portion of the saccharine matter of vegetables is then in a disengaged state, and fit to be converted into ardent spirit. It is singular, that the specific temperature, or the entire process,

though this science, in the confined sense of the word, has not hitherto been of much real benefit to husbandry.

These THREE KINGDOMS may be considered in another point of view, and that is in regard to MECHANICAL POWERS. The qualities and capacities of matter, by means of which mechanical power is effected, are its *gravity*, *cohesion*, *extension*, and *motion*. The various powers of mechanism may be reduced to the *lever*, and *inclined plane*. Upon the principle of the former the steelyard is constructed; on the latter, the wedge, screw, and cart-wheel. The application of these in husbandry is as various and extensive as the diverse forms of its machinery and implements; from the spade, which is simply a lever, and the plough, which operates chiefly on the principle of the wedge, to the thrashing or grinding machine, which adds to their powers the principle of the screw and the agency of motion, and the cart-wheel, which acts as an inclined plane according to its diameter and breadth.

The importance of husbandry in completing the usefulness of a country residence must be sufficiently obvious. But the neglect of this study by those who have assumed the profession

for converting grain into malt, has not yet suggested some new means of facilitating the vegetation and final growth of those seeds, the product of which has long been emphatically denominated the *pabulum vitæ*.

of laying-out grounds has been productive of the worst consequences. By attending entirely to external show, or mere perspective effect, in the production of landscapes (which may look well enough on paper,) kitchen gardens have been placed in unsuitable soils and situations formed upon bad principles. The disposition of the other parts is equally unprofitable and inconvenient, and the whole residence disordered from erroneous ideas of picturesque beauty. Farms also have been subjected to the same inconveniency; and extensive pasture fields, lawns and parks, have been rendered unprofitable, useless, or expensive to the owners, from neglect of the most simple and obvious principles of agriculture, and often from neglect of the common practices of farmers in improved counties. I scarcely need advert to the evils which have arisen from planting on the contracted principles of what is called landscape gardening. Mr. Kent has justly remarked, that "Gentlemen are apt to consider themselves as great planters, merely because their habitations are surrounded with a thick margin, half the trees of which will never be of any national use; while heaths, moors, hills, and other uncultivated grounds, which might enrich the owner and the public, by producing timber fit for the navy or other purposes, are left entirely neglected."

I shall mention another general evil which has resulted from the neglect of the study both of the theory and practice of husbandry, and which is perhaps greater than all the others: this

is, that *those unacquainted with such arts produce plans which never can be executed.* This is evident from the writings of several authors; and it explains the reason why few or none of those shewy plans or views for altering and improving places which some have published, have ever been executed; or if some have, it has always been in a different way from that represented in the drawing. Let me not be thought uncandid or severe in particularizing these things; they are mentioned, first, with a view to justify gentlemen in disregarding the plans of such professors; and secondly, that those who propose following the art may attend to this branch of it; both in theory, by reading books, and studying nature; and in practice, by serving apprenticeships to agriculture and gardening; a practice which is neither inconsistent with high birth, riches, nor politeness, as some of the greatest men of this age have evidenced. I may further add respecting the neglect of this study, that many things are hence obliged to be left to the direction of gardeners, bailiffs, or foresters, who, though frequently conversant in their respective branches, yet generally and of necessity have more or less contracted ideas, and in most cases are without sufficient experience in regard to general design and contrivance. Thus they often lead their employers into immense expences, which frequently end in total disappointment, and too often in mischief and ruin*.

* A striking instance of this has just come under my notice. Since writing the preceding page, I have been called above a hundred miles into the country by a

After this general introduction to husbandry, I proceed to that branch of it which is the immediate subject of this part, viz. Agriculture; and I shall do nothing more than notice a few particulars from the several parts of the science, chiefly to shew their use in laying out the grounds of a residence. These I shall arrange as follows:

1. The improvement of the soil and surface. 2. The improvement of the situation. 3. The culture of the vegetables used in agriculture. 4. Breeding, rearing, and fattening of cattle. 5. The formation and management of farms.

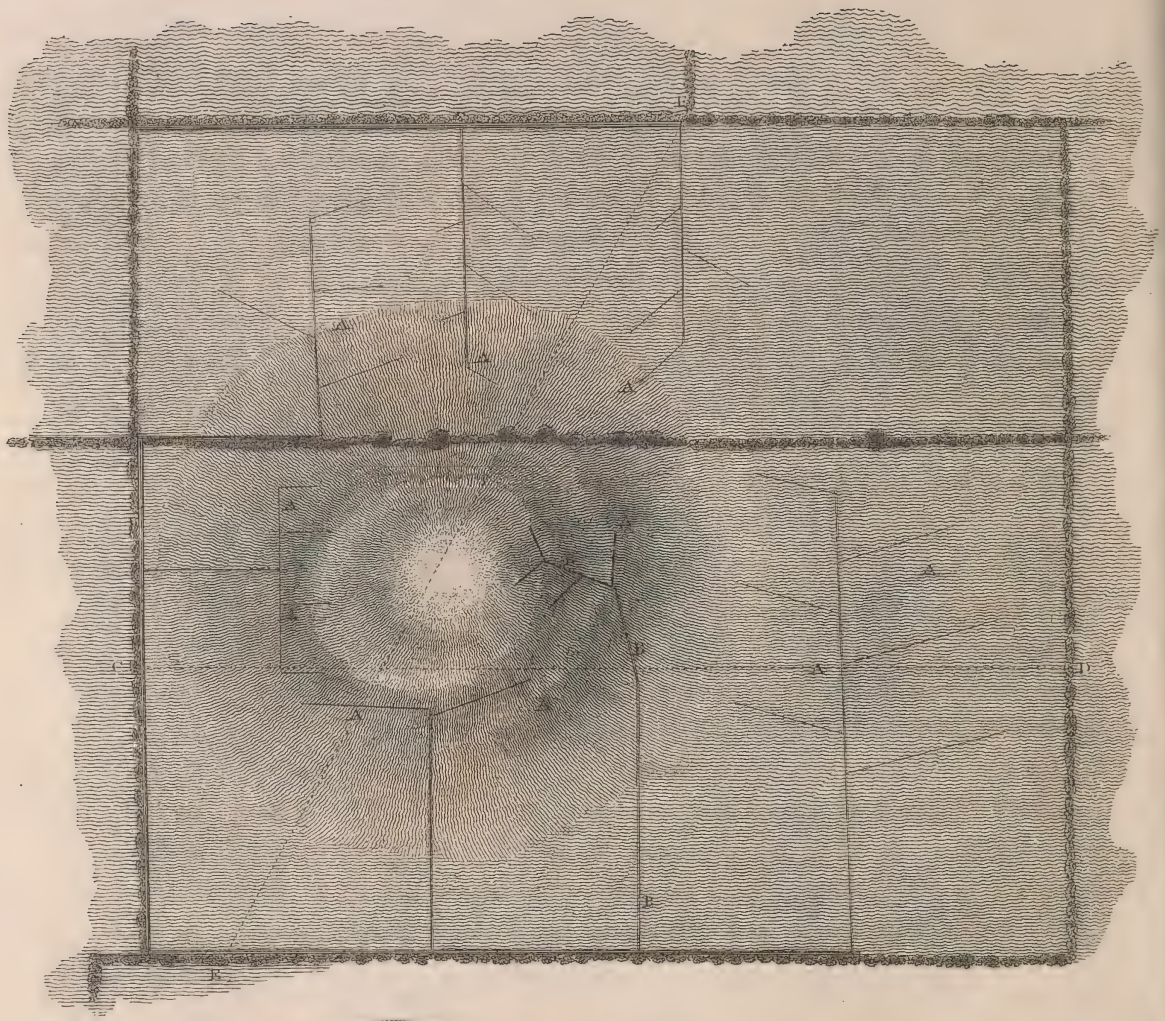
friend of mine, who some years ago, by the advice of a gardener and nursery-man, formed a large garden, and built an uncommon number of hot-houses; the whole upon such a bad plan, and in such an improper situation, that they are a perfect nuisance to his place; which is otherwise by nature and artificial planting equally surprising, grand, and romantic. The garden walls, hot-houses, masonry, and sheds are almost one entire ruin; nearly every pane of the glass in the hot-houses is broken, from bad glazing, and an erroneous conceited opinion of making the panes overlap an inch over each other. The wood-work is twisted, and of four times the requisite size and weight. The garden is in a low moist bottom between hills, and consequently subject to chilly damps and mildews. The whole cost several thousand pounds; and unless speedily improved will soon be a complete ruin.

CHAPTER I.

OF THE IMPROVEMENT OF THE SOIL AND SURFACE.

DRAINING.—This is of three kinds. 1st, The draining of springs, or water issuing from the bowels or internal strata of the earth; 2dly, The draining of lakes, bogs, fens, or morasses, or water stagnated in hollows or among the surface strata; and 3dly, Surface, or Essex draining; which is used for preventing, certain soils from being over moist in times of rain, &c.

The draining of springs depends upon the knowledge of the internal strata, or layers of soil, stone, or gravel, under the surface. This may be obtained from observing the manner in which the springs burst forth; from the appearance when the ground is broken to any depth, as in quarries, gravel-pits, banks of rivers, &c.; by digging pits, or by boring with the *auger*. In the practice of this mode of draining, the general method is, to intercept the springs, by cutting drains across declivities, either of such a depth as to penetrate into or through the strata containing the water; or, when the drain cannot conveniently be dug so deep, the same thing is accomplished by digging pits



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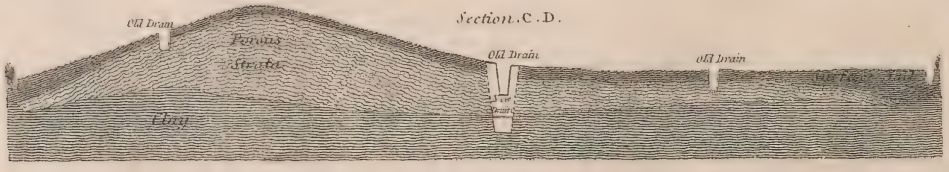

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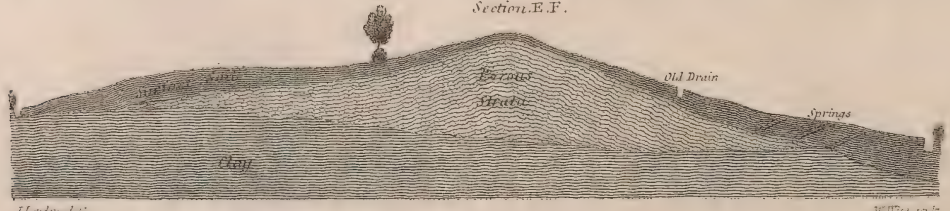

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or boring holes; both which are perfectly simple, and easily understood and executed. The practice of boring and digging pits is sometimes made use of for carrying off water, by letting it sink from the surface into lower strata (as well as for bringing it forth into the cuts or drains); and this practice sometimes produces astonishing effects at very little expence. Much may be done, however, and often very striking effects are produced, by cuts alone, without either boring or making pits: a considerable number of these have come under my notice in different places; I shall here mention one which occurred at Kersehall some years ago. The two fields in Plate IX. are upon an irregular hill or knoll, and contain nearly thirty acres. The water which issued forth at A A A rendered them not worth 20 *s.* an acre; and the drains there shewn were made at a great expence to carry it off, but without effect. My father, however, having paid a good deal of attention to this branch of Georgics, on examining the substrata along with me, caused the drain B B to be cut, which in less than a month drained both the fields, and the land is now worth 3 *l.* an acre. This drain, when made, did not cost one-tenth part of the amount of the others; and the difference of preserving it in repair must be comparatively nothing in this case; as the others are mostly on a loose bottom, and so small as easily to be choked up. The sections C D and E F will, without any explanation, shew the reason of this success; which arose from the inclination of

the strata towards the hollow B B, and from their termination on the sides of the hill under impervious clay or loam. Errors, similar to those adopted in the first drains cut in these fields, are common every where, and occasion vast expence; numberless instances, both in England and Scotland, might be adduced; but let the above suffice to caution those who proceed to this business, to devise a proper plan ere they attempt any part of the work. Much might be said as to the practical operation of this branch of draining; such as the form of the drain, the cutting, filling, covering, repairing, &c. but the whole of this part of the volume is only calculated to contain a few general hints chiefly respecting design.

The draining of lakes, bogs, morasses, or fens, is less expensive, and often more simple, than the foregoing. It depends upon finding a sufficient outlet for the main drain; from which others are cut in proper directions, so as to lay the whole dry. Much information may be obtained on this subject by travelling through Lincolnshire and Ayrshire, and in those two counties by inspecting what has been done by Sir Joseph Banks* at Revesby Abbey, and J. Smith, Esq. at Swineridge Muir. No species of draining pays so well as the draining of fens, marshes,

* Sir Joseph Banks has acquired land worth upwards of 60,000*l.* and will gain much more.

and lakes, which commonly turn out the most productive of all soils. Morasses and peat bogs are of a different nature: they may commonly be drained at little expence; and the moment the operation is completed they begin to improve; the growth of the *sphagnum* is checked; decay ensues; and, supposing nothing else to be done, in a few years grasses and other vegetables appear upon the surface, which will in course of time become clothed with tolerably good pasture.

Surface draining is the most simple of any; being little more than mechanical labour. It is known to every agriculturist, and is performed with excellent effect in Essex and Peeblesshire. In this last county it has been of immense service.—See an excellent Survey of the Agriculture of Peeblesshire, by the Rev. Charles Findlater.

Embanking.—As this subject, so far as I know, has not been treated by any author (for Dugdale's history of it contains nothing of the practice), and as I have had considerable practice in designing embankments either for preserving or gaining land from rivers or the sea, or for guarding the banks of rivers, I shall extend these hints to a length that had been otherwise unnecessary in a work like the present. I shall, therefore, make some remarks under the following heads:

1. Of the general causes of the failure of embankments already made.

2. Of the forms of the most secure natural shores and banks of rivers, with the causes of their security.

3. Of the modes of imitating these forms by art, or of improving upon them.

4. Of the preservation of embankments, or banks of rivers, by erecting piers or projections to ward off the current.

5. Of the materials with which embankments are constructed.

6. Of the expence of making embankments.

7. Of the management of land gained from the sea.

8. Of the quantity of land which might be gained by embanking, and preserved by constructing piers.

Fig. 1.

Fig. 2.

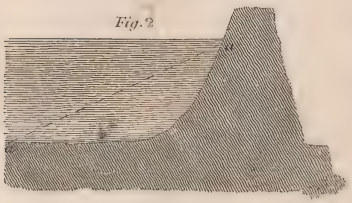


Fig. 3.

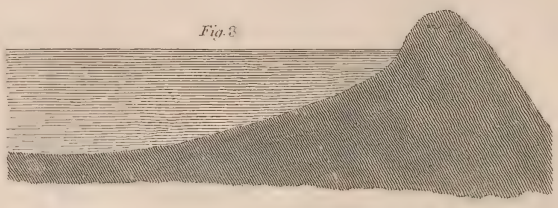


Fig. 4.

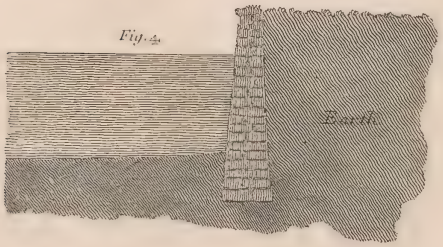


Fig. 5.

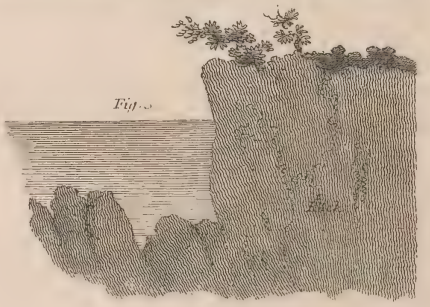


Fig. 6.

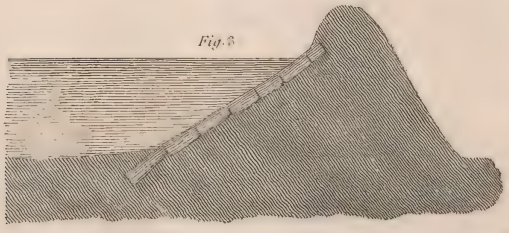


Fig. 7.

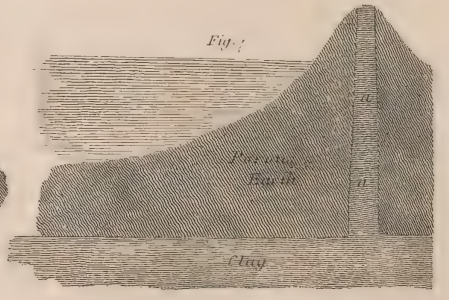


Fig. 8.

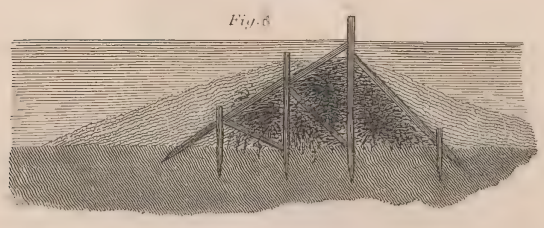
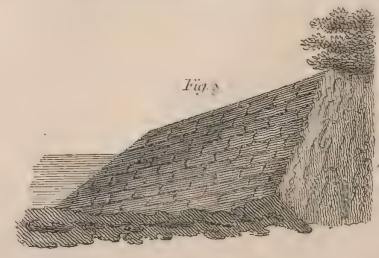


Fig. 9.



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SECT. I. OF THE GENERAL CAUSES OF THE FAILURE OF EMBANKMENTS ALREADY MADE.

THE general causes of failure are two: the first concerns the *form* of the embankment; and the second the *materials* with which it is constructed.

1. With respect to *form*.—Embankments are generally made too narrow at the base, in proportion to their height; by which means, the side next the sea is too upright (as is represented in Plate X. fig. 2.) Hence, it is unable, in high tides, to withstand the weight of the sea; which, it must be remembered, presses laterally as well as downwards. Another very bad consequence of this form is, that the tides, in ebbing or flowing, act a longer time on one place, than if the slope were more gradual; and, consequently, they have a much greater tendency to break or damage the surface of the bank. Most of the embankments that have been constructed in England are of this form, more or less varied, and the materials generally of earth or turf. Bays, or creeks, are the most favourable situations for this kind: there, if they endure until the sea leaves sand or mud against them, so as to form a gradual slope next

to it, (shewn by the dotted line *a a*, fig. 2.) they may answer very well; but in the situations where they are commonly placed, the sea is very frequently making breaches in them, which are with much difficulty filled up; and if this work be for a very short time neglected, the whole embankment will be ruined.

2. As to the *materials*, it is of less consequence with what the body of the embankment is constructed, provided those used on the surface next the sea be of the proper kind, and that the whole will contain water. Where the slope next the sea is such as shewn in fig. 2., no material, that is not equal in effect to close-jointed pavement, will be complete. Earth, turf, sand, shells, gravel, or common causeway, are all liable to be damaged by the beating of the tide. Causewaying is much inferior to a good coat of gravel. Even though the slope were considerable, still it does not resist the action of the sea. The water enters at the crevices, sinks down among the stones, loosens the clay or earth below, part of it is divided and carried off every tide, vacuums are formed below, one small stone sinks from the rest, a larger succeeds (which gives more room for the operation to go on), some of the surface-stones follow, and the sea, now rushing in with violence, soon displaces the rest, and ruins the embankment. This is almost always the case with heads thrown across rivers, or causewayed banks,

made to preserve bold shores which are apt to be washed away or undermined by the action of water; for they have seldom been properly built with mortar, and pointed with strong cement, or built with hewn stone very neatly jointed, either of which are sufficiently durable. Notwithstanding these general censures on embankments, however, there are numerous instances in which they have answered the purpose in the most satisfactory manner. Those made of earth, in some places in England, are 100 feet broad, and only 12 or 14 feet high; and these have always been proof against the tides. Some quays are built with mortar * made from powdered unburnt limestone and coarse sand, and pointed with puzzolana earth; and these resist the sea like solid rock. But the general errors which I have noticed, have been sufficient to raise numberless objections against the common mode of making embankments, and have also deterred many from attempting to gain land from the sea.

* A water cement, or mortar that hardens under water, has been formed, by mixing four parts of blue clay, six of black oxyde of manganese, and nine of carbonate of lime; this mixture, after being submitted to a white heat, is mixed with sixty parts of sand, and water sufficient to form it into mortar. At Dorking, Surrey, is found the limestone used for the West-India and WappingDocks, which has been considered as capable of forming the most durable mortar of any in this country.

SECT. II. OF THE FORMS OF THE MOST SECURE NATURAL SHORES AND BANKS OF RIVERS, WITH THE CAUSES OF THEIR SECURITY.

In examining the sea-shore, or the banks of rivers, we uniformly find, that the least liable to be damaged are such as have a gentle, easy slope from the bed of the sea or river to the top of the shores (as Plate X. fig. 1. *a.*), or such as are composed of solid perpendicular rocks (as fig. 5.); both of which I shall consider separately.

1. The *sloped banks*, or inclined planes, on the sea-shore are least liable to accident from the surge and high tides, when they are covered with a coating of sand or gravel. Those on rivers are best defended from extraordinary floods when they are uniformly covered with close pasture grass to the edge of the water. The *strength* of these banks depends upon the length of the slope; their *durability* on the uniformity of its surface, one part not being rougher or harder than another.—From the *length of the slope*, the river, as it increases or decreases, and the tides, as they ebb and flow, act but a short time on one part of their surface. The greater the weight of water on the bank, the more it is pressed down, and the firmer it is ren-

dered. From the *uniformity of the surface* the water acts with the same power on one part as on another. Were a few stones or bushes distributed on it, the water would form eddies round them, each of which would soon become a large hole. If the surface be harder in one place than another, a similar effect will be produced.

2. Bold, perpendicular, rocky shores are always backed by earth or other rocks (as represented in the section, fig. 5.); and it is evident, that their *strength* consists in the resistance of this accumulation of materials, not in their disposition, as in the other kind. Their *durability* consists in the compactness and uniform texture of the rocks on the side next the sea. If it be full of clefts, or if some parts of it be of a softer nature than others, the sea in time will enter these, and break down the bank more or less, according to these circumstances. Instances of this frequently occur, of which there is a recent example in the land that perished by the sea in the Isle of Wight.

SECT. III. OF THE MODES OF IMITATING THESE FORMS BY ART, OR OF IMPROVING UPON THEM.

1. In many places on almost every sea-coast, we see shores of the first kind (fig. 1. *a.*); and it will not be denied, that if a trench were cut down behind one of them, as represented in this figure by *b*, the bank or shore, though now detached as it were from the land, would be equally strong and capable of resisting the pressure of the sea as before. This being granted, it follows, that if a bank or mound were moved and placed two or three miles from shore, within the bed of the sea, as suppose at *c*, it would be as strong as ever, and no more liable to be broken down by the water, than when in its former situation; and that, here, it will as completely guard the sea from the intermediate space of two or three miles, as it formerly preserved it from the bottom of the trench *b*, of three or four feet wide.

2. Shores of the second kind, (fig. 5.) more or less perfect, abound on most sea-coasts. The cause of their strength and duration has been already noticed. They cannot be wholly imitated with advantage; but excellent hints may be taken from them for defending bold, abrupt, broken shores composed of earth, or of earth and rocks mixed. It will at once occur,

that building a perpendicular wall of good stone, against broken abrupt shores, will make them nearly as strong and durable as the natural ones, which are composed of perpendicular, solid rock. A case of this kind occurred at Seacliff, near Edinburgh. (See fig. 4.)

Walls built thus are of great use in defending abrupt sea-shores. They are not so generally applicable to rivers; because there, the water, in times of flood, requires room to spread; and this is the great use of sloping their banks;—but this mode, by confining it on every side, would only tend to make it do more damage than before. There may be cases, however, where it may be desirable to defend one part of the banks of a river without sloping them, or to defend one bank at the expence of that opposite; and here it may be used with propriety,—though piers properly made in such places are often more complete, and always more economical. Between these two kinds of banks, which are natural, art may contrive one, which shall answer some of her purposes better than either.

3. In place of collecting such a quantity of earth or other materials as will be necessary to form a bank similar to fig. 1. or 3., it may be more economical to make one such as fig. 6.; the side next the sea forming an angle with the base of 45 degrees.

This will bear all the weight of water that can possibly be put on it, equally well with fig. 1., only the action of the tides would break the surface of the side next the sea, which we may contrive to prevent, by coating that side with the durable material in the natural kind, fig. 5., or, in other words, paving it with flagstone or bricks.

4. Between this and the first natural kind, a great variety may be contrived, differing only in the degree of inclination towards the sea; that which has the greatest slope, as fig. 1., being coated over with sand or gravel; that which has the least slope, as fig. 6., covered with pavement; and the intermediate slopes coated with materials between the two extremes, as coarse gravel, chalkstone, brick or sand, as in fig. 7. It may be observed of this embankment, that it is wholly made of a sandy loam, and placed upon soil of the same nature; but as this would not sufficiently contain the water, at least for some years after it was built, an upright column of clay is carried up the centre from the argillaceous substrata below. This column is represented by *a a* in the section, fig. 7. The case occurred at Edenside, near St. Andrew's.

In some very sandy shores, embankments may be made entirely of wicker-work. Three or four rows of paling may be made of different heights, and the intervals between them filled

with furze, brushwood, or straw, &c. (fig. 8.) These materials would retain the sand as the tide passed through; and in a very short time an embankment would be made of the form shewn in the figure, which should then be planted with the *elymus arenarius* to bind it. At extraordinary tides it would continue to attract more, until at last it was raised above their reach. I know several places (Severn, Humber, Frith, &c.) where from twenty to thirty thousand acres could be gained by this mode in a few years!!

Whatever kind of embankment is constructed, proper sluices and tunnels, with valves next the sea, should be placed here and there according to circumstances, to allow the water collected within to pass off, and the sea to enter occasionally, either for admitting the practice of warping or depositing sand, or mud, to raise the surface of the land gained, or to flood the soil, in order to produce salt, marsh, &c. &c.

SECT. IV. THE PRESERVATION OF EMBANKMENTS OR BANKS OF RIVERS BY ERECTING PIERS OR PROJECTIONS TO WARD OFF THE CURRENT.

In nature, we see the great power of projecting points on the sea or rivers; either upon a great scale, as promontories defending bays and inlets; or upon a small scale, as rocks, roots

or stones, defending parts of the banks of rivers, by throwing the current to the opposite side. This naturally leads us to the idea of piers, which are of great use either in defending embankments, or the margins of brooks or rivers. In the former case, they may generally be made and coated over with the same material as the embankment itself. In the latter they should be made of stone decreasing every way as they project outwards, as shewn in fig. 9. In both cases, however, they may be composed of brushwood fastened to stakes with much better effect. Frequently a simple fence of rude wicker-work, (called in many places stakes and rice) three or four yards long, will be sufficient. Stone embankments, unless made as shewn in fig. 9., often form eddies below them; but fences of brushwood cannot operate in this manner. They have the same mild effect in checking the rapidity of water, that a hedge has in softening a current of air.

In the designing and disposition of piers or projections in rivers, considerable reflection is requisite, to ascertain the proper spot in which they should be placed, and the exact length which they should project into the river: too great a projection endangers the opposite bank, and may produce an eddy below the pier, and a reverberation from the opposite bank, which will do more harm than if no pier had been built. When the pier is to be built of stone, which is necessary in rivers of rocky

bottoms, fig. 9. is the best shape, as it will scarcely produce any eddy, and will have an effect almost as mild as one of wicker-work. This pier was designed for and highly approved by the Hon. Lord Sinclair of Herdmanston, to guard and preserve a valuable court of stable offices from the river Tyne, which was rapidly undermining them some years ago. It is built of rubble masonry internally, ashler work externally, and with mortar prepared in the proper manner.

Piers of wicker-work, which answer well, may be seen on the river Jed near Crailing, and on the Almond near New Liston.

SECT. V. OF THE MATERIALS WITH WHICH EMBANKMENTS ARE CONSTRUCTED.

THE perpendicular kind of embankment, fig. 4., for defending abrupt shores, as already mentioned, is simply a wall, which may be good brick-work, rubble-work, or ashler. The mortar used should be of the strongest kind; or else, if built in the common way, they should be pointed with puzzolana earth, or Roman cement*. The sloped embankments may be made of

* Prepared by Parker and Co. London.

common earth, clay, mud, stones, or a mixture of these; or any materials which will form into a solid, compact mass. The side next the sea, of such as fig. 3., which forms an angle of twenty degrees, or any side forming an angle between that and thirty-five degrees with the base, may be covered with sand, sea-shells, or gravel, from the natural shores; or stones may be broken of uniform sizes, about three pounds weight each, and used in the same way; or, should neither of these be at hand in sufficient quantity, it may be covered with mats of reeds, straw or bark *, which require to be renewed frequently; or, it may be defended by a fence of brushwood placed upright all along the bottom of the bank, and of the same height, which tends to break the force of the waves; or the whole face of the bank might be covered with brushwood, either in bundles, or as wicker-work, or neatly laid on and fixed down with long poles and strong hooks. It might be causewayed with stones and moss—or moss might be spread on the bank, and then covered with wicker-work—or moss † might be wrought into the wicker-work, and then these mossy covers neatly laid on and pinned down, which mode would last a very long time—or by various other ways, some of which would require no attention, as gravel, stones, &c.—or by others that would require

* As is done in Holland.

† Plants of moss in their living state are meant here; such as the *sphagnum*, *bryum*, *hypnum*, &c.—not mere peat.

constant attention and occasional renewal, as straw, mats, brushwood, &c. The side next the sea, of such as fig. 6., which forms an angle with the base of forty-five degrees; and all the variety of slopes or inclined planes between that, and those where the inclination forms an angle of thirty-five degrees, may be covered with flag-stone*, jointed with cement made of clear sand and powdered, unburnt limestone, puzzolana earth, or Roman cement: or, if flagstone cannot be had, clay may be found, and bricks of proper kinds may be made, and used in the same manner as stone.

In those planes inclined between 40 and 45 degrees, it will often be more economical to cover with stones about six or eight pounds weight, laid on eighteen or twenty inches deep; or with a bed of moss of three inches, or peat-moss † of six inches thickness, laid on the bank, and then a covering of similar stones of only six or eight inches thick: or these stones may be causewayed, or laid in strong clay, and their surface jointed or plastered over with lime, or strong cement of any kind that will harden ‡ quickly, and endure the action of the tides and the air, which will operate upon it alternately, &c. Cases may occur where it will be most economical to cover the

* A case of this kind occurred at Tullyallan, the property of Lord Keith.

† That kind called the flow-moss will answer best.

‡ See p. 207.

side next the sea with wood, such as the larch *(alone,)* or any other wood coated over with pitch and sharp sea-sand. Even old sail-cloth or oil-cloth, pitched and sanded, and then neatly laid on, will answer as completely as pavement during a certain time, although these materials will fail much sooner. Perhaps in some cases it might be requisite to cover it with a metallic substance, as sheet-lead, or tinned copper plates; or by many other ways, at different rates of expense, and diverse degrees of duration.

SECT. VI. OF THE EXPENSE OF MAKING EMBANKMENTS.

Although the expense of embanking is considerable, it is far from being so great as is generally imagined. It is, however, impossible to mention any specific sum for this purpose, unless certain *data* were given; but, from the different calculations and estimates which I have made for various places in Great Britain*, I find that a *dike* of earth covered with gravel or sand, such as fig. 1. Plate 10. would cost from threepence to eightpence per cubic yard;—such as are of a more steep slope, say from thirty-five to forty-five degrees, and covered with pavement, from sixpence to one shilling per cubic yard; the

* Partly for my own information, and partly for proprietors, as Lord Keith, the Earl of Selkirk, Earl of Galloway, &c.

kind, fig. 4., from ten pounds to twenty-five pounds, per rood of thirty-two yards. The barrier recommended for soft grounds, which, at first gaining from the sea, will not bear the weight of a wall, that is the one composed of brushwood, or stake and rice, will cost from sixpence to five shillings per lineal foot.

SECT. VII. OF THE MANAGEMENT OF LAND GAINED FROM THE SEA.

The principal difficulty that can occur in any situation will be, to keep off the water of the rivulets or rivers that may come from the surrounding lands, and to deliver to the sea the surface water collected from the land gained; the next consideration is to clear this land of surface incumbrances.

It will frequently happen, that the ground to be embanked is intersected by a river. This is the most expensive and difficult case that can occur; but it is only necessary to carry an embankment along each side of it to the sea; and there, where it intersects the other line of embankment, to place a floodgate*, which shall prevent the tide from entering, except when it may be necessary to admit vessels, and which shall allow the

* Such a gate may be seen at Lynn, Norfolk.

water of the river to pass into the sea. Small rivulets and springs can either be turned along the margin of the land gained, and let out at one end of the embankment, where it joins the land, or led the most convenient way to one or more of the valves or flood-gates which it is necessary to make in all embankments for excluding the water within. The water collected on the surface of the land gained, will generally be let off by the flood-gates or valves already mentioned; but where the embankment is extended into the water, this cannot be the case, as the level of the sea will generally be above the level of the land. In this instance, windmills for driving pumps must be placed at proper distances, according to the particular case. Perhaps, in general, one small windmill driving four pumps, would be sufficient for draining 1000 acres. The expense of such a pump-mill would not be above twenty or thirty pounds. By making a small embankment from two to four feet high some distance within the larger one, all the water collected between that and the original shore would be accumulated; and it might be led in a raised canal in the same level to a flood-gate in the outer embankment. This would leave very little water to be drawn up by the pump; and, in this way, though 20,000 acres were gained, one windmill only would be necessary*. Often, and indeed in most cases, in place of a wind-

* As I proposed in the design, estimate, and report, given in for embanking 4000 acres in Wigton Bay.

mill, the brooks, rivulets, or springs collected within might easily be made to turn a water-wheel, which would be more permanent and uniform than that turned by the wind. A bason might also be constructed, so that the ebb and flow of the tide would turn a draining-wheel; or a great many other methods might be successfully adopted. Thus, in land gained from the sea, there cannot be any difficulty in preserving it from water, from whatever quarter it may come. When the land to be gained is covered (more or less) with stones, these should be put in flat-bottomed boats at low water; and when the tide floats them, they should be rowed to the proposed line of embankment, and then dropt. This mode of conveyance will generally be found the most economical with all the solid and distant materials. When the ground is sandy or poor on the surface, and argillaceous earth or rich loam below, it may be trenched (with the plough) of such a depth, as to turn up the good, and bury the bad soil*. If the soil be shallow, and even rocky, it may still be rendered valuable. The most rocky parts may be covered five or six inches with soil, and the whole sown either with meadow grass, to be flooded with fresh water, and kept as meadow; or with other grasses, as the *juncus bulbosus*†, &c. and kept as salt marsh. When mud of a good quality and considerable depth is gained, it may in some cases

* As might be done at Aberlady, East Lothian.

† The grass that generally composes salt marsh pasture.

be desirable to summer-fallow it for one or more seasons after it is embanked. At other times, it may be better to sow it with rapeseed for the first season, and to summer-fallow it the next, as preparatory to a corn crop, &c.

No kind of land can be gained from the sea but what is of great value, in consequence of this peculiar circumstance, that it can be flooded most generally by fresh water as well as by the sea at all times. By flooding, the most barren sand or rock, with only an inch or two of soil, will bear excellent pasture. Indeed, much of the sand that is often reckoned barren and useless, is mixed with broken shells, and, upon examination, will be found to contain three or four parts in ten of calcareous earth. Most of the large rocks within the salt water mark are in a state of rapid decomposition, and so fragile on the surface, as to be easily penetrated by the roots of grasses; more particularly after they have been exposed a year or two to the action of the atmosphere. I do not here mean the large detached stones that we often find within the water-mark; these I suppose to be either buried in the ground, or boated off as before mentioned; but those continued rocks which frequently constitute the basis of the sea-shore for several leagues together, and the surface of which is so completely oxydated and sometimes decomposed, (in which state they are vulgarly called *rotten*) that they will yield either an excellent manure for cer-

tain soils, or are fit to support the vegetation of saline plants in their actual condition.

SECT. VIII. OF THE QUANTITY OF LAND WHICH MIGHT BE GAINED BY EMBANKING, AND PRESERVED BY CONSTRUCTING PIERS.

With respect to the quantity of land which might be gained from the sea or rivers, by embanking in the above way; I have only to say to individual proprietors adjoining shore lands of every description, that nothing more is necessary than to observe how far out the sea ebbs at ordinary tides; and they may safely conclude that it is practicable to gain and preserve at least half of that land which appears uncovered by the water at that time, and that such land, when gained, will be of equal, if not superior value, to the best parts of their estates. With respect to the quantity that might be gained throughout the whole island, I could not exactly say; but I think it cannot be less than three millions of acres.

I have offered little, in the foregoing hints, respecting the modes of defending the banks of rivers, or altering their

courses; but if the general principles noticed be properly applied, many great advantages will arise to proprietors. I know some estates that lose, from the encroachments of rivers, several acres annually; which five or ten pounds, judiciously and timely applied, would completely prevent. The advantages that arise from placing proper flood-gates on the mouths of rivers which the tide enters, are very great, as may be seen in several places in England*. In embanking land from rivers, one great advantage is, the deepening of their course, by which vessels of a larger size than formerly may be admitted to traffic in them. This is a well known fact, and of considerable importance.

It may be observed, that as embankments are made here and there on the borders of rivers and sea-shores, the intervening spaces will thus become bays; and quantities of shells, mud, sand, or gravel, will soon be deposited there by the tide; so that these, however difficult to be embanked at first, will in the course of years be as easy as natural bays and creeks are at present. Thus, many rivers which, in their present state, are eight or ten miles wide at their junction or influx with the sea, may, in the course of years, be only two or three furlongs. Such embankments would not only be highly advantageous to the landed proprietor, but also to the merchant and manufac-

* See Marshall's Management of Landed Property.

turer, as many of our rivers might thereby become much more easily navigable than they are at present, and those bars which frequently obstruct their mouths (as the Severn and Avon near Bristol) would by such means be entirely removed.

Warping, paring and burning, and clearing of surface incumbrances, come next in order in the list of improvements. The first is derived from what we see takes place in nature, where land is covered by muddy water, either on the sea shore, or on the banks of rivers. It is of great use, and is successfully practised in Lincolnshire. Paring and burning are seldom advisable; clearing the surface of stones, roots, bushes, &c. is easily understood.

Improving the composition of soils is held out by agricultural chemists as of great importance; and although their observations have not hitherto been of much consequence to practical men; yet the discoveries already made with regard to the proper food of plants and vegetables must eventually be of incalculable advantage, in facilitating the increase of the vegetable productions which support animal life.

Inclosing. This important branch of agriculture naturally divides itself into, 1. The propriety and advantage of inclosing. 2. The size of inclosures. 3. Their form. 4. The

direction of the fences. 5. The kind of fence, and 6. Hedge-row timber.

1st. With respect to the propriety and advantage of inclosing either commons or private property, I shall advance nothing; it being pretty generally known to be of the first consequence as to augmenting their value. There are, however, some cases, as the large sheep-farms in Peebleshire, and most parts of the Highlands of Scotland, where no other inclosure is necessary than a *ring fence* or barrier round each farm. If any inclosures are necessary within this fence, it is only such as are for admitting the cultivation of a few acres for the use of the farmery, or for making some plantations for shelter.

2nd. The *size or magnitude* of inclosures depends on the kind of husbandry to be followed, the nature of the soil, of the surface, and of the climate. 1. In pasture farming, where the object is breeding, the inclosures should generally be small; where it is rearing, larger; and where it is fatting, largest. 2. Each kind of soil should be as much as possible kept separate; so as that every part of each field may be laboured and cropped at the same time. 3. On a level surface the inclosures should be largest, on a hilly one least; as the greater the number of inclosures there are, the more the shelter is increased in severe weather, moisture preserved in dry weather, and beauty pro-

duced at all seasons. In a severe climate, or one excessively hot, inclosures should be more numerous than in moderate temperatures—in order that in the former shelter, and in the latter shade, may be produced.

3rd. The form of inclosures. The best form, where it can be obtained, is that of a square, or parallelogram: when the latter, it should have the length from north to south. The nature of the soil, and the variations of the surface, are the best guides both as to the form and size of inclosures.

4th. The direction of the fences. In general, this should be up the sides and directly across the tops of eminences, which greatly increases their apparent height. Sometimes, however, it is preferable to carry them obliquely across, which is better calculated for the direction of the ridges, and for affording shelter and shade. In levels, or vallies, they have the best effect, and are most useful, when parallel to the rising grounds, when they intersect one another at right angles, and when each inclosure is nearly a right square.

5th. The kind of fence. In meadows, these should be of the unseen kind; either ha! ha's! open water-cuts, or light palings. In low fertile arable grounds, and all arable grounds in mild exposures, they should be low hedges or walls. In

exposed and elevated grounds, the higher the fences so much the better, both for effect and utility. Almost every part of the country has some fences peculiar to it. By enquiring into these, and contrasting them with those in other parts of the country, the best and most economical may easily be discovered.

6th. Hedgerow timber. This is highly advantageous in certain soils and situations, and highly destructive, both of beauty and use, in others; as I shall have occasion to observe under PLANTING*.

SHELTERING EXPOSED GROUNDS. In fixing on the proper places for marking out plantations of this sort, considerable reflection is requisite. It does not consist in fixing on the highest spots, and in a regular distribution of the masses, as some tell us; but in finding out where the current of wind strikes most violently, either when first obstructed by the hills, or after it has been reverberated; which often points out declivities, and lesser eminences, as proper places for planting upon; and directs us also to proportion the magnitude of the different plantations, in a manner corresponding with these effects. A knowledge of this may be obtained by examining the appear-

* See also, in confirmation of the same ideas, Mr. Kent's Hints on Landed Property.

ances of such trees as are already there, by inspecting the grounds in times of deep snows, and by consulting the oldest native inhabitants, particularly shepherds, &c. In situations exposed to the sea, where the shore is bold or irregular, as at Colzean, Gossford, and Dunglass, similar caution is necessary; but where it is level, as at Tynningham, Southwick, and Mersehead, it is only necessary to plant along the margin of the shore. This has been done at Mersehead and Tynningham; at the latter place with the greatest success, and at the former with a very promising appearance. At Linkhouse I have lately made considerable plantations on a low shore, which, though only planted two years, look as well as on any other situation. The trees, when put in, should either be very young, or else the fences should be of considerable height, so as to shelter them. In low shores, most species of trees will succeed except the larch. In such as are bold and irregular, the ash, sycamore, sorbus, elder, &c. are the best. For other particulars respecting the formation and management of such plantations, see PLANTING.

CHAPTER II.

OF THE IMPROVEMENT OF THE SITUATION.

ROAD MAKING may be considered under the following heads: 1st, Direction; 2dly, Formation; and, 3dly, Management.

1. The direction of roads in level countries is easy. On such as are hilly it requires some attention, surveying, and levelling, so as to find the shortest and least fatiguing line. There are few or no countries, though ever so irregular, but will admit between their hills or mountains roads nearly level, or at least very gradual ascents and descents: were it otherwise, the vallies would be continually covered with water; whereas we always find some outlet or passage by means of which it easily runs off. The most difficult cases are, when a road comes directly in front of a compact ridge of low hills, such as the Cotswold in Gloucestershire, or those between Thirsk and Helmsley, called Whitestone Cliff, in Yorkshire*. In such cases, the only way is to make the road ascend in a zig-zag direction to the lowest part of the summit. There is no particular advantage in having the surface of a road exactly level during its whole

* Hills of this kind seldom occur, except in level countries, such as England.

length; but, on the contrary, some benefit results, to draught cattle at least, from having a variation of surface to pass over, as it varies the line of draught, and rests it alternately on different parts of the body. Something of this kind takes place in walking, as every one accustomed to use this exercise in any considerable degree must have experienced.

2. The formation of roads. The first requisite is to lay them dry, by open drains at each side, which must be of a depth and width proportionate to the road. When the latter is narrow, and the drains deep, the pressure of carriages is apt to cut the surface and derange the materials. The surface of the road in level countries is generally made somewhat convex, in order to throw off the rain; but in mountainous districts it is perfectly level; and in some places *concave* roads have been adopted with considerable advantages.

3. The management of roads refers to cleaning and repairing them. Excellent management does not consist so much in doing a great deal, as in a constant attendance and reparation of every little injury; by this means roads may be kept in proper order for a great length of time, and at a small expence.

On CANAL MAKING I do not judge it necessary to advance any thing, as it is a branch of national improvement in which

I have never had much experience. On the advantage of erecting VILLAGES AND COTTAGES much might be said; but I rather refer to what I have already advanced on this subject under ARCHITECTURE.

CHAPTER III.

OF THE CULTIVATION AND THE CULTURE OF VEGETABLES USED IN AGRICULTURE.

THE CULTIVATION of the soil includes several things; the chief of which are, 1st, Its pulverization or comminution; 2dly, The destruction of weeds and insects; 3dly, Manuring.

Of the different implements used for pulverization, the Norfolk wheel-plough seems the best for light soils, and the improved Lothian swing plough the best for stiff soils and general purposes: both are worked by two horses. Oxen seem the most proper draught animals when a slow continued motion is required; horses when a quick or occasionally violent motion is requisite. The amiable and diversified qualities of the horse, however, will often, no doubt, preponderate over the real ad-

vantages to be obtained by employing oxen. The Wynne harrow * seems the best in almost every case. There are two distinct kinds of spades; one proper for sandy soils, and garden work; the other for stiff, cohesive soils, and for farm operations in general. It is difficult to describe these two spades without a drawing: practical men will understand the difference when it is observed, that the mouth-plate of the one is solid throughout, while that of the other has a considerable open space under each tred. The former is used in the nurseries about London and Edinburgh, and in most gardens; the latter is pretty extensively used in Renfrewshire, and in several parts of Gloucestershire. Very great advantages result from employing this last kind. Pulverization is jointly accomplished by the weather, by the alternate operations of frost and mildness in winter, and drought and rain in summer; by the shade from vegetables, as the pea and bean tribe; and in some degrees by the roots of others, as the carrot and the clover. The advantages of pulverization are, that it renders the earth more susceptible of the fertilizing influence of the external elements, as heat, air, rain, &c. enlarges its capacity and facility of yielding nutriment to the roots of vegetables, and facilitates the destruction of extraneous seeds, which preoccupy the nutritive principles of the soil, instead of leaving them to support the cultivated plant.

* See the Bath Society's Papers.

2. The destruction of weeds.—Weeds may be divided into two classes; those which spring up annually, and those which are perennial. The former are destroyed in broadcast crops of corn, and in naked fallows, &c. by harrowing when they appear alive on the surface; or in drilled crops by hoeing, either with the hand or horse-hoe. The latter are chiefly destroyed by fallowing, either partially, as in the preparation for potatoes, barley, turnips, &c.; or completely, as in naked or summer fallows. In this part of cultivation, much depends upon knowing the nature of the weeds to be destroyed, and much upon our preventing them from coming into seed. There are some seeds which, although buried under ground for many years, do still germinate where brought within a certain distance from the surface; such as *avena communis* (wild oats), the *rhaphanis raphanistiam*, and *r. vulgaris*, which are very common weeds. A field that has been infested with these all the summer, will have its surface covered with their seed at harvest; if the ground be ploughed soon after, the seed will be preserved in the soil for years; but if it be allowed to remain until spring, and then gently harrowed, the whole will vegetate, and may easily be destroyed. In this way all seeds of weeds could be rendered ineffectual; though it is not always consistent with the general management of a farm, as it throws the labour behind, and prevents the land from deriving the advantage of the winter's frosts, &c. One field, however, managed in this manner each year, would soon

clean a whole farm, and the future attention of a judicious husbandman will ever take care to keep it so. The destruction of insects, or pernicious animals, is also a duty incumbent on the cultivator; but in agriculture it is too trifling to demand consideration here.

3. Manuring.—Manures may be divided into two kinds; those which promote vegetation, by augmenting the quantity of vegetable nourishment, as all vegetable and animal matters; and those which promote it, by bringing what already exists into action, or by communicating to the soil the power of seizing from the atmosphere, digesting, and gradually administering the nutritive principle to the plant, as lime, salts, gypsum, and most mineral substances, do. The proper application of putrescent manures is one of the most important, and at the same time the most critical branches of cultivation. A given quantity of manure inserted in the soil in a proper stage of putrescency, when the soil is in the fittest state to receive it, when it is no sooner distributed on the surface than it is covered, and when the crop is soon after to be planted or sown, will produce astonishing effects. Apply the same quantity either in a more or less putrescent state, leaving it exposed to the atmosphere for weeks, and covering it as long before the seed or plants are inserted, and it will produce comparatively no effect. The qualities of putrescent manure are of such a fleeting nature,

that the utmost attention is requisite to collect them; and, when they are collected, to preserve them from returning to their simple state, which is ultimately gaseous or aerial. This subject fully considered will shew the immense importance of not letting any vegetable substance, if possible to avoid it, be dried in the sun; but of collecting all organized bodies that can be found, such as leaves, weeds, peat, moss, &c. and forming them into composts with calcareous matters, and other putrescent manures, as practised and explained by Lord Meadowbank *, and recommended by the Highland Society. It also shews the immense advantage of *soiling* with clover, tares, or lucern, and the great benefit of the turnip husbandry. Calcareous and mineral manures are most successfully applied to lands containing vegetable matter, either chiefly or almost entirely, as peat soils; in the body of the soil, as arable grounds; or on the surface, as old pasture lands. Lime is also used on ferruginous soils, which it frequently improves, unless the iron exist in very great proportions. Some mineral manures are also of advantage from the salts which they contain; as lime and gypsum are supposed to be by some, and as salt and soot are known to be by every ingenious agriculturist †.

* See also the Earl of Dundonald's Remarks on Chemistry and Agriculture.

† So convinced am I of the great benefit to be derived from strewing salt on the surface of grounds, that I hesitate not to say, that if the tax were removed and farmers allowed to use it, double the quantity of pasture would be produced annually.—

WATERING is a species of cultivation which will be noticed under the culture of grasses, but which might also be very advantageously employed to all grain in the spring months.

CULTURE.—The culture of vegetables in farming divides itself into, 1st, The different grains or corns; 2dly, The different grasses; 3dly, Roots and leaves, or other herbage; and, 4thly, Particular crops, as hops, madder, rape, &c.; or garden vegetables, as onions, spinage, &c.

1. The different grains or corns are either cultivated in broadcast, or in drills. The former method is in most cases the best with corns and grasses, especially on cohesive soils; the latter almost always the best method with roots, leaves, and indeed all the others. The different corns are commonly sown by rotation, one species succeeding another every year.

2. The grasses are either cultivated a number of years together, as in pasture fields, meadows, and lucern, &c.; or only two or three, as in the case of sown hay crops. A knowledge of the

That this pasture would not only be equally good with that where no salt is used, but much better and earlier, is evident from the effect of salt marshes. This subject deserves the attention of the present enlightened administration; and it may serve as one instance to shew what thin partitions separate mankind from the most important discoveries, and their application to the necessary arts of animal existence. What immense advantages might not result from it in years of scarcity!

different grasses is of importance both in useful and ornamental agriculture. Perennial rye-grass *(lollium perenne)* is the most generally useful for good soil; common meadow grass *(poa trivialis)* the best for middling soils; large meadow grass *(poa pratense)* the best for rich meadows. *Festuca flutans*, or floating fescue, the best for middling meadows. The *holcus lunatis* the best for mossy lands or bad meadows. The *festuca avina*, and *cynosurus cristatus*, the best for sheep pastures. The *juncus palustris* the best for salt marshes, &c.

In cultivating grasses three modes require to be mentioned, which are of considerable importance: the first is *top-dressing* with manure; which, when done early in spring, greatly augments the crop; the second is *irrigation*, which is naturally suggested by the effects of small brooks upon the sides of hills, which run along their margins, and wherever they overflow are sure to produce good grasses and white clover, except in a few instances where the water is impregnated with mineral substances injurious to vegetation. Irrigation is a very simple, but most excellent practice. It may be performed by farmers in all hilly and pasture countries with the greatest ease and at a very little expence. In Herefordshire, Montgomeryshire, &c. it is much practised, both with brooks, and in times of rain with the water collected on the highways. The pasture of fields so managed is always much earlier than others.

The third mode adopted in the cultivation of pasture lands is *flooding*, which differs from irrigation only in this, that the ground is covered or flooded with the water, which remains stagnated upon it for a considerable time; whereas in irrigation it runs constantly off. Flooding is derived from nature; for we see it take place when large rivers overflow their banks for some time in the winter season, and leave after them a considerable coat or layer of mud or slime which greatly enriches the pasture. It is nearly allied to warping; but differs from it in this, that warping is used when the quantity of mud deposited is so great as would bury the grass, and thence is chiefly used in arable marshes or over salt grass, which being a species of rush *(juncus palustris)* easily springs through it. Flooding is of immense advantage* to mossy meadows, even though the water be clear and not capable of depositing mud.

In the preparations for flooding ground, two things are requisite: the first is, to lay it as level as possible, or to divide it into different levels; the second is, to convey the water to them in a safe and judicious manner, so as not to interfere with the

* On the estates of Baldoon I had the honour of being employed to estimate the advantages to be derived from draining, embanking, irrigating, and flooding; and the improvement which I conceived the mossy meadows were capable of from flooding was not thought over-rated at triple their present annual value.

cultivation of the surrounding fields. This part of the business is sometimes critical in mossy or sandy ground. In a comprehensive scheme devised by me for flooding, at Linkhouse, nearly 2000 acres of blown sand or downs near the sea, and covered with little more than *elymus arenarius*,—the reservoir to hold the water for this purpose, being built in sandy ground (though tolerably well puddled), broke down as soon as it was filled with water, and apparently defeated the whole scheme. Fortunately, however, this took place when little more than 15*l.* had been expended. Soon after I found it equally practicable, and not much more expensive, to turn off the stream further from the ground, and lead it to different parts in gutters, either made upon the surface, or in the most sandy parts formed of wooden or baked-clay troughs or conductors. When this has been accomplished a few years, it will render ground which now rents at 13*s.* an acre annually, worth 4*l.* 4*s.* for the same period.

3. Roots, leaves, and other herbage, are commonly cultivated by the drill husbandry, and often serve the double purpose of a crop and fallow. Their culture, though various, is simple and easy.

4. Particular crops, or garden vegetables.—This class includes some very profitable crops, and a considerable diversity

of culture; generally inconsistent with the business of extensive corn or pasture farmers, but well calculated for such as have small farms in good soil, especially if near towns or cities. The culture of garden vegetables in the fields deserves the particular attention of landed gentlemen; as they may thereby save much of the expence which is at present incurred in kitchen gardening, and are besides sure of having sweeter vegetables. Indeed, those roots and plants which are reared in gardens being always forced into luxuriance by manure, it often imparts to them a particular flavour, or destroys their natural one, as in the case of cabbages, potatoes, and turnips, which are cultivated in that manner.

CHAPTER IV.

OF BREEDING, REARING, AND FATTENING ANIMALS; AND OF THEIR GENERAL MANAGEMENT.

THIS branch of rural economy, as observed in the Introduction, depends much upon a knowledge of several facts in natural history which will enable the judicious farmer to improve upon general practice: being less connected with laying out a residence than the others, a few remarks only shall be offered.

I shall pass over the different modes of breeding (whether for preserving the same race unadulterated, or for improving the stock) and come to REARING; which, whether it regards beasts of labour or for the butcher, is of much importance. Beasts of labour, with respect to food and shelter, should be brought up hardy, by allowing them chiefly such food as is of a coarse nature, and keeping them in such an exposed situation as will accustom them in a considerable degree to the atmosphere. In consequence of this mode of treatment, animals grow to a much larger size, and become capable of enduring much

more fatigue. Training is an important branch of rearing beasts of labour. Much depends not only upon the knowledge, but also upon the natural temper, of the person employed for this purpose. We always observe, that horses, which have been long under the care of the same servant, imbibe in a considerable degree his temper and spirit. In horses, as in men, this temper and manner, if impressed upon them at an early age, generally remain through life. Common labouring horses generally acquire all their bad practices while under the dominion of those boys which in farmeries have the care of attending them and other cattle while at pasture: whereas if this business were committed to grown up persons of steadiness and ingenuity, or, were these young persons better instructed and more critically looked after, the advantages would certainly be considerable. It would render an animal that is useful much more so, and prevent many accidents which arise either from bad education or inherent vicious habits*.

* It is impossible to mention the horse without regretting the cruelties which, by the lower classes, are every where and every day inflicted upon this noble animal, as well as upon asses, mules, and horned cattle. It is deeply to be regretted, that there is not a suitable and effectual mode of punishing such offenders. Even in London, where working horses are uncommonly sagacious and tractable, it is shocking to see the unprovoked cruelties of draymen. In Edinburgh it is much worse; there the cart-horses are, besides this barbarity, generally overloaded, always in bad condition, often covered with wounds, bruises, and putrefying sores; sometimes they are seen to drop down dead in the streets, and frequently are starved to death in the stables of their inhuman proprietors!

Many of the above hints will apply to cattle reared for the butcher; as a good-tempered well trained animal always feeds best. Small bones are in general most favourable for fattening, and are produced by a practice contrary to the above, viz. by feeding with rich food when young. Tameness and gentleness of temper, which are produced by kind treatment, are highly favourable to the same purpose*.

The rearing of poultry, game, fish, rabbits, and bees, is worthy of notice, and is useful in a country residence. Too little attention is generally paid to nature in rearing game. Pheasants or swans are not so easily reared under domestic hens, as other birds are, such as the turkey, peacock, &c. Much depends upon encouraging the former when allowed to go wild, by giving them proper and abundant cover, and sowing among it such herbs as they are particularly fond of; some of these are cresses, chervil, parsley, thyme, &c. which also tend to encourage and domesticate hares. Abundance of fearless game about a residence adds a peculiar nobleness and appearance of liberty (so to speak) which few things else can communicate.

The general management of fish† and bees‡ is commonly

* See Messrs. Culley's excellent work on this subject.

† See Bradley's Husbandry, and Marshall's Kitchen Garden. ‡ Bonar on Bees.

understood.—For the construction of aviaries, poultry-houses, fish-ponds, &c. see Part IX. Of the conveniencies peculiar to a residence.

CHAPTER V.

Of the size, formation, and management of farms.

The size of farms has occasioned considerable altercation among agriculturists and speculators on political economy; some contending for their being small, others very large, and others again for different sizes, limiting the largest to a given number of acres. It is easy to see that all these schemes must be equally wrong. It is one of the greatest blessings of this country, that there are farms to be had of all sizes, and of every diversity of yearly value; by which means the unlettered but industrious peasant may gradually ascend to wealth and independence; and at the same time the judicious agriculturist, who possesses capital and information capable of enriching himself and introducing improvements, has an opportunity of embarking at once and of reimbursing himself for the sum laid out. The consequence of parcelling out the country in large farms

alone would tend to destroy liberty. The consequence of small farms alone would occasion great variation of prices and occasional dearths. These things will appear plain to every one who chooses to reflect a little upon the subject. The general conclusion which I draw is in favour of all sizes of farms; not all sizes upon each estate, though something of this sort a prudent landlord will attend to also; but I wish, principally, all sizes to be found in the country in general. Some countries require to be laid out almost entirely in large farms, as sheep-walks; others in small ones, as wherever particular crops are attended to, as hops, orchards, &c. In stiff and moist clayey soils, as well as in very dry ones, large farms are highly advantageous, as giving the farmer a command of strength to enable him to work these soils at the proper seasons. In small farms these soils seldom yield their full produce: the moist clay is laboured when too wet, and the dry loam cannot always be overtaken in time, particularly in the culture of turnips and barley; by which means it loses the sap or moisture, and thence the crop either fails entirely or is materially injured. Middling soils, that is, such as are free, deep, and of moderate moisture and easily laboured, are in every case the best for small farms. The proper way, upon the whole, with this as with many other things in political economy, is to leave the business entirely to itself.

In the FORMATION OF FARMS, two things chiefly require consideration: 1st. Their subdivision by fences; and, 2dly, The erection of proper buildings. I interfere not with their subdivisions in regard to crops, that being sufficiently known and followed by every intelligent farmer. With regard to subdivisions in general, the remarks offered under ENCLOSING may suffice also for this branch of formation. I shall only observe farther, that frequently in arable farms, where the soil is of great value, as in some parts of Mid and East Lothian, where it lets from five to ten pounds an acre, the cheapest fences are hurdles, either of pitched or tarred fir wood, oak, or young larches. Hurdles also are of great use in family farms, especially in uniting them with the park or lawn, and also in partitioning off part of the park in order to join it with the country. This will be explained in a subsequent part of the volume. The farm designed for Barnbarrow is almost wholly subdivided in this way, and will tend to unite it with the park in a beautiful manner; and also to render the latter more valuable, by occasionally bringing the whole, or at least the greater part of it, under the plough for such a period as may be necessary to bring the soil into excellent condition. The same thing has been executed from my designs at Mountwhannie, which shews the excellent effects that residences would have if laid out in this way. Mr. Gillespie, the proprietor of this estate, saw at once the superiority

of this scheme over the mode of clumping and surrounding every place with a belt, to the exclusion both of the family farm and the country. Though this wretched taste prevails everywhere around him, and though he had already gone a certain length in it himself, he with a great and liberal spirit instantly rejected the remaining part of his plan, and adopted that which is here recommended. At Hopton court ideas corresponding with this principle were recommended in the design for laying out that place as an ornamental farm of a particular kind, pasture and orcharding being the chief products. I had the happiness of seeing these plans fully approved of; and every part of them is carrying gradually into execution, under the proprietor's own general superintendence, with my occasional visits.

I proceed in the next place to give a few hints respecting buildings for the different kinds of farms.

1. Arable farms.—The situation of the buildings should, if possible, be near the market road, near the centre of the grounds, and either on an eminence or open space, so as to command *wind*, or near a brook, so as to obtain the advantage of *water* for machinery. The large expensive barns erected in England may generally be dispensed with, the extra cost of these barns would be much better laid out on a thrashing

machine, which is an acquisition of considerable importance to arable farms*. Wheat, which is commonly kept in the barns in England, would be much safer if preserved in stacks or ricks, as in the northern parts of it, and in East Lothian and Berwickshire, where farming is at greater perfection than in any other county.

2. Pasture farms.—The buildings are few in sheep farms, and not numerous when the object of the farmer is rearing cattle or horses. They should be placed in the most convenient situation as to roads and water.

3. Mixed kinds; that is, pasture and aration together, or alternately, such as where the *convertible* or Berwickshire husbandry is followed, require the same consideration as arable farms.

4. Family farms, or such as are made for the convenience of a residence, are almost always of a mixed kind. The lawn near the mansion affords pasture for rearing sheep, the park for rearing other cattle and horses, and sometimes for fattening them; at least it may always be partitioned off by hurdles for this purpose. Small old grass parks or paddocks, which, according to

* For the best plan of a farmery for arable grounds, see the Farmer's Magazine, which is conducted by one of the best wheat cultivators in the United Kingdom, Robert Brown, Esq. of Markle.

the way I propose for laying out a residence, ought to unite the park with the farm or general country, form excellent pastures for milch cows, breeding mares, &c.; or for growing meadow hay; and the arable farm supplies artificial hay, corns, roots, leaves, garden vegetables, green food for soiling with, and every thing else to be expected from a complete farm*. The buildings on a farm of this kind require to be equally various and comprehensive with the purposes for which the farm is used. The chief group of them, or what may properly be called the farmery, should be near, or at least of easy access from, the family offices or livery stables; at the same time contrived so as not to interfere with the principal approaches to the mansion, nor to shew from it the common operations in the yard. Field operations are of a different nature, and may frequently be shewn from a mansion.) Such a farmery should be well connected

* I had an excellent opportunity of embodying my ideas on this subject, and on every thing else respecting the formation of a complete and extensive residence, in the treatise, estimates, designs, plans, and models given in to Sir Hew Hamilton Dalrymple, Bart. I had the honour of seeing them fully approved of; and should nothing occur to prevent their full execution, the natural advantages of the situation, and the good taste of the proprietor, will certainly make it one of the finest places in the island. It will unite all the beauties of Mount Edgecumbe on one side, and more than those of the woods and grounds of Hawkstone, within itself. The practice of some would justify me in giving plates from these designs, *without hinting whether they were already executed or approved of, or not.* But this and other species of quackery I despise, not wishing my fame (if I may ever obtain any) to depend upon ostentatious exhibitions on paper, but upon real execution, and general good principles in my art.

with all the parts of the farm, the park, the paddock, and the public roads; and should, if possible, be in a situation to take the proper advantage of wind or water, &c. Besides the principal group of houses, which, as mentioned under ARCHITECTURE, should be dignified or elevated in character, other sheds and hovels for shelter of cattle, and hay-ricks, may be distributed in different parts of the old pastures, which, besides their utility, have an excellent effect as objects in rural scenery.

THE MANAGEMENT OF FARMS includes a great variety of objects. But as it is a branch in general better known by bailiffs than most others, and besides, as it does not come within the province of a designer in laying out a residence, scarcely any thing need be offered here. I shall just mention, that gentlemen, in choosing bailiffs, should endeavour to obtain them as much as possible from a soil and situation similar to their own, but farmed in a more scientific and profitable manner: or they should first ascertain what species of husbandry or management will best suit their situation, what particular improvements might be introduced, such as the drill husbandry, flooding, irrigation, cultivation of peat moss, &c. and then procure a person from a part of the country where these practices are best performed. Where such places are, is easily learned, either from any well-informed land valuator, or from the agricultural re-

ports of the different counties. I may observe however, upon the whole, that the husbandry of Northumberland and Berwickshire is the most extensively useful, and that the best bailiffs are commonly obtained from those countries. They have, in general, acquired such an education and habit of observation as, besides enabling them to transplant their own practices, renders them capable of improving upon that of the country in which they may be called upon to employ their talents.

BOOK I.

PART V.

USEFUL OR CULINARY GARDENING.

INTRODUCTION.

HORTICULTURE may be subdivided into CULINARY OR USEFUL gardening, including the production of fruits and vegetables for the kitchen; ORNAMENTAL gardening, including the production of vegetables for show, beauty, and amusement, as parterres or flower gardens, or instruction, as in botanic gardening; and, NURSERY GARDENING, which comprehends every thing relating to propagating and rearing either trees, shrubs, or plants.

Culinary gardening, the branch to be here considered, is separated from Agriculture on the one hand, only by the difference in the implements used for cultivation; and from Ornamental and Nursery gardening on the other, by the difference

between the objects in view. All the operations of this mode of cultivating the earth being manual, on a limited scale, and more interesting to individuals, it is thence calculated to effect the highest degree of vegetable produce from a given surface. Culinary productions being more or less requisite for every state of society, as well as for every family, are peculiarly so for the wealthy and independent; and thus, in ages of general ignorance and barbarism, gardening might exist in considerable perfection from the encouragement given to it by the chiefs or nobles. Hence it has been generally better understood than agriculture, and hence also agriculture has derived many of its greatest improvements from gardening. The theory of gardening, like every other branch of husbandry, is derived from the study of nature; either simply, as from the observation of the three kingdoms; or abstractedly, from chemical or mechanical experiments. Having made some remarks on these subjects in the general introduction to husbandry, I shall, without farther preamble, proceed to glance over some of the principal topics in this branch of it:—without a full and practical knowledge of which, I am well convinced, it is impossible for a designer to understand the art of laying out a kitchen garden *.

* It may be observed here, that from the short remarks offered in this division of the work, the practical and scientific reader will discern much better whether the author understands husbandry, than if he had made a more copious treatise on the subject. Here his business is to seize on the prominent features, and such as chiefly refer to the design of a garden or farm. This is both easily done and

The remarks offered will be included under the following heads: 1. Of the cultivation of the soil. 2. Of the culture of herbaceous vegetables. 3. Of the culture of fruit trees and fruit shrubs. 4. Of the culture of culinary exotics. 5. Of forcing vegetables into a state of growth, so as to produce fruit at particular or unnatural seasons. 6. Of the construction of hot-houses, hot-walls, pits, hot-beds, and mushroom-houses. 7. Of the other buildings requisite for a kitchen garden. 8. Of the formation of orchards; and, 9. Of the general formation of a garden.

easily discerned by those of practical knowledge. But this observation is made in order to arouse the attention and excite the enquiry of those superficial readers, who may think the whole of what I have advanced on this subject a mere compendium from books, and which might have been written by any person without much practical knowledge.

CHAPTER I.

OF THE CULTIVATION OF THE SOIL.

WITHOUT making any remarks on draining, clearing of incumbrances, or any of the first improvements of the soil, I proceed to PULVERIZATION, which in horticulture is performed chiefly by the spade, with the occasional assistance of the mattock. On the surface, it is performed by the hoe and the rake, as in destroying weeds, or in stirring the earth about the roots of young vegetables. Pulverization is also much promoted by frost, as in ground laid up in ridges; and by the alternate effects of heat and rain, as in that dug or trenched during the summer months. In MANURING garden grounds, composts are preferable, or at least putrescent manure in the last stage of decomposition; when rank or new, it never fails to give a peculiar and disagreeable taste both to the roots and leaves of culinary vegetables. This every one must have experienced in early potatoes, or such as are raised on what are called *lazybeds*. It is to be regretted for the sake of agriculture, that kitchen gardens require so large a proportion of manure. The scheme of culti-

vating most of the summer crops of greens and roots in the fields, and of resting the soil, as to be afterwards proposed, it is thought will tend to counteract this evil. In many places where peat moss abounds, considerable advantage may be obtained by mixing a quantity of that material with the stable dung used for making up hotbeds.

RESTING or REFRESHING garden soil is a species of cultivation which is performed two ways. The first is, by sowing a certain portion every year with corn and grass seeds, letting it remain under the last for three or more years, and then breaking it up again. This is a very beneficial plan, and is advantageously practised by most market-gardeners, who use the corn or grass so raised for their cattle. In gentlemen's gardens, care should be taken never to let the grass run to seed, as is sometimes done in the market-garden; but in other respects the general practice should be performed in the same manner. By sowing and laying down a certain quantity annually, a similar quantity may be broken up: this will consequently afford so much fresh soil every year, upon which such crops as answer best on new land, as onions, carrots, and indeed most garden crops, may be raised.

The second mode was invented by Mr. Walter Nicol*, who

* Author of *The Forcing Gardener, &c.*

may be ranked among the best culinary gardeners that Scotland ever produced. It is excellently adapted for producing the same effect as above, and should be used jointly with it; by which means a large portion of fresh surface soil would every year be obtained. As this practice is not much known in England, I shall give the directions for performing it in Mr. Nicol's own words. "Take three crops off the first surface, then trench three spit deep, by which the bottom and top is reversed, and the middle remains in the middle; take three crops of this surface, and then trench two spit deep, by which the top becomes the middle and the middle the top; take also three crops off this surface, and then trench three spit deep, whereby that which was last the middle, and now the top, becomes the bottom; and that which is now the bottom, and was the surface at first, now becomes surface again, after having rested six years. Proceed in this manner alternately; the one time trenching two spit deep, and the other three; by which means the surface will always be changed, and will rest six years and produce three. Hence will there always be new soil on the garden for the production of wholesome vegetables; and hence also will much less manure be required than when the soil is shallow and the same surface constantly in crop."

Rotation is the species of cultivation next in importance. In managing it, the vegetables cultivated should be divided

into classes according to their respective *natures*, *modes of culture*, and *duration*. With respect to *natures*, they may be divided into, 1. Such as have ramose roots, as the cabbage, cauliflower, brocoli, &c. 2. Such as have fusiform roots, as the carrot, beet, parsnip, &c. 3. Such as are squamose, as the onion, leek, eschalot, &c. 4. Such as are fibrous, as the lettuce, endive, &c. 5. Such as are tuberose, as the potatoe, Jerusalem artichoke, &c. They may be also divided into such as partake of two of these divisions, as the fusiform and fibrous, exemplified in the bean, pea, kidney-bean, spinach, &c. &c. Some crops require to be cultivated in large quantities, as pease, turnips, onions; others in small portions, as most salads and pot-herbs. Some require very rich soil, and generally manure previously to planting or sowing, as celery, cauliflower, and leeks; others require a tolerably rich soil, but are much injured by manure immediately previous to their insertion, as carrot, beet, and most esculent roots of fusiform shapes. With respect to *modes of culture*, culinary vegetables may be divided into, 1. Such as are sown upon the surface broadcast, as onions, turnips, spinach, &c. 2. Such as are sown or planted on the surface, but in drills, as pease, beans, and potatoes. 3. Such as are placed in hollow trenches, as celery, and sometimes artichokes. 4. Such as are sown or raised on beds or ridges, as asparagus, sea-cale, and frequently early crops of pease, &c. 5. Some require

the soil to be often pulverized while growing, as potatoes, pease, and most drill crops; others admit of it but in a small degree, as onions, leeks, carrots, &c. Some are occasionally and often materially injured by it, as strawberries. With respect to *duration*, some are sown and removed within three months, as early crops of turnips, radishes, brassica plants, for removal, &c. others continue double that time, as onions and potatoes; others treble, as frequently brocoli, and cabbages; some continue two seasons, as parsley, fennel, &c.; others for several years, as strawberries, asparagus, artichokes, &c. A judicious gardener, by studying the above, and other divisions which might be made, will thence contrive a proper succession of crops: thus celery, by being planted in hollow trenches, pulverizes the soil in a high degree; by requiring a considerable quantity of manure, it enriches it; both which properties are necessary for the production of plants of large ramose or fasiculate roots, which penetrate deep into the soil, such as artichokes, scorzonera, asparagus, &c. Again, these crops by remaining long on the soil afford, when removed, an excellent situation for such as are more transitory, as pease, potatoes, &c. Every experienced gardener knows that it is of the utmost importance to study a proper rotation of crops; for the same thing happens in gardening as in agriculture, whenever two or three of the same kind, or of the same natures, fol-

low each other, they never fail to degenerate both in quantity and quality.

THE DESTRUCTION OF WEEDS is performed upon the same principles as in agriculture; the only difference is in the application of labour, which here is always manual, and is either by the spade, hoe, rake, weeding-iron, or by the hand. But in gardening, if attention be paid to the fermenting of putrescent manure, and spreading and exposing other composts before they are used, and never letting any weeds perfect their seeds, there will be comparatively little occasion for the operation. These things, however, and particularly the preventing of weeds from flowering, are too little attended to by most gardeners. It is true that, after all, the birds and the wind will continue to distribute these enemies to cultivation; but their effects are as nothing when compared with those of ill-fermented stable manure, and the seeds of such weeds as are produced in the garden.

THE DESTRUCTION OF VERMIN is an important branch of cultivation, that in gardening, as in agriculture, is not well understood. Some are, after all that has been tried, best destroyed by gathering with the hand as soon as they begin to appear, as the caterpillar tribe; others by plentiful steaming, dew, or watering, as the aphis; others by tobacco smoke, as

the thripes; others by compositions of various kinds, such as soap-suds and sulphur, lime-water, &c. as the coccus, phalæna, &c. Some are caught by artifice, as wasps, flies, mice, &c.; others are devoured by the introduction of other animals, as the grub by the rook, the snail or worm by the duck or gull, &c. Blight* is most probably produced by insects, or is rather a collection of small insects; sometimes it is removed by changing the situation of vegetables, and removing them to a more open exposure; at other times by placing them in a more invigorating soil; and very commonly by placing them in a higher situation. Honey-dew is an exudation from vegetables, which frequently breeds an immense collection of small insects upon their surface; a more invigorating soil is often a complete cure for this malady, particularly where it attacks young trees.

Watering, in horticulture, is generally performed by the hand, and either with the common watering pot, the syringe, or the forcing engine. In many cases I think it possible to accomplish it by a practice similar to irrigation, or by sub-flooding. The last may be done by having a stratum of gravel

* According to Sir Joseph Banks, Bart. and some others, *mildew* or *rust* in wheat is occasioned by a parasitic plant that insinuates itself into the pores of the straw, and thereby prevents the grain from obtaining its proper nourishment. Others have supposed the yellowish red appearance on the straw of grain to be a mere vegetable tumour, occasioned by obstructed circulation, and the blight of the ear only, to be produced by insects.

under the whole garden; which, by means of a trench surrounding it (or, if upon a slope, at the upper side of it), might be saturated with water, which would soon be absorbed by the incumbent surface containing the vegetables under cultivation. The first by having pipes, open cuts, or rather small wooden troughs, which might conduct it upon the surface of every quarter of the garden. There it might distribute itself in the intervals between beds or drills, and over the general surface of broadcast crops. The former method could be put in practice at any period of the summer or spring; the latter chiefly in moist weather, or in the night season. Watering is beneficial in three ways: first, in prompting or exciting vegetation, as in new-sown seeds, or newly transplanted vegetables; secondly, in promoting vegetation, as in watering crops or trees; and thirdly, in destroying insects, as the aphis or red spider, and some species of coccus, &c.

Pruning is a branch of cultivation highly requisite in horticulture, particularly in what regards the culture of trees and shrubs. It is used either to promote, to retard, or to modify growth. Pruning may be used either to promote the growth of wood, leaves, or fruit, or to retard them. With respect to the modification of trees and shrubs, it is applied to many sorts to bring them into convenient shapes for being cultivated with care; as to gooseberries, raspberries, shrubs in pots, &c.;

and to others, to make them accord with peculiar situations, as often occurs in connexion with training in the management of wall-trees. These different objects of pruning are to be effected from a general acquaintance with the vegetable economy, and a particular knowledge of the individuals to be pruned. With respect to general laws, the common effect of pruning *that part of trees above ground only*, is to produce more vigorous annual growths; and in respect to fruit, commonly a smaller number, but those of greater magnitude. The common effect of pruning *the roots of trees only*, is the contrary, and generally causes them to produce smaller and less vigorous annual shoots, but more fruit. Much pruning, either of the tops or roots, makes them produce smaller and more numerous ramifications; which, as they are unable to run out to any great distance in quest of food, either from the air or the earth, do consequently form a spherical bush above ground, as may be seen in pollards; and a globular mass of roots under it, as may be seen by taking up any tree which has been frequently removed. In general also, the extremities of shoots or branches bent downwards, and the extremities of roots bent upwards, check vegetation and tend to produce fruit; while an opposite practice has contrary effects. With regard to individual trees, there are some sorts which only produce their fruit from the young wood of the preceding year, as the vine, the fig, and the raspberry. There are others which produce them from two

years shoots only, as the peach and nectarine. Others produce them chiefly from *studs*, or *spurs*, as the apple, pear, and plum. Some by both these modes, as the apricot and gooseberry. Others almost entirely from studs and knotty joints, as the red and white currants, &c. Some trees require most of their young wood to be cut off, as the currant; others very little of it, as the peach, and most pears; others are materially injured by being much pruned, as the cherry, plum, and most stone fruit. Some bear any degree of it, as the apple and several kinds of pears.

Training by fixtures is properly a branch of pruning. It is used for two purposes; either to protect exotics or tender fruit trees from the wind; to improve their climate, by spreading them regularly upon a wall, or to support climbing or trailing plants. The first method is generally performed either by spreading the branches, horizontally and parallel to each other, upon an upright rail, as in common espaliers, or by spreading them upon a horizontal rail, as in table espaliers. In some cases it is also done upon an inclined rail, or upon circular or basket ones. Training to improve the climate is chiefly against a wall, and is either performed in the *fan*, or *horizontal* manner. The fan manner is calculated for soonest covering the wall, and is also most proper for such kinds as do not abound in superfluous wood, as the cherry, peach, and

apricot. The horizontal manner fills the wall more completely, though it is longer in accomplishing it; and is best calculated for such as run much to wood, as do many pears and apples. In training to support climbing plants, nature should be imitated as nearly as possible. With such kinds as twine round other trees or supports, or fasten themselves to walls, nothing more is necessary, than to put these on similar objects within their reach; but with others, which support themselves by clasp-ers or tendrils, it is requisite to fasten them by art when these tendrils fail. In nature, they fail commonly the second year; and then the whole twining shrub or climber falls down, or hangs by its last made tendrils in such a way that its shoots are bent, twisted, or inclined in every direction. This is the case with vines, passion-flowers, and many others, and readily suggests the advantage of training these sorts in a twisted or serpentine direction. Indeed, nothing can be more unnatural than to train them erect, as is generally done where vines are planted against the back walls of hot-houses. When trained upon a trellis under the sloping glass, they are in a more natural situation, and are more likely to send out shoots or to *break* (as gardeners term it) at every joint; but still experience has proved the immense advantage of training in a serpentine direction in every situation. In many hot-houses in England, and in the greater number in Scotland, nearly two-thirds of the crop which might be produced annually are lost for

want of attention to this circumstance. It requires no arguments to support a practice so evidently natural, and uniformly attended with such good effects whenever it has been tried; and as it can never do harm, every gardener ought to adopt it*. Great advantage may be taken of the same principle in training other trees; whenever the sap is constrained by twisting a shoot or branch, it is sure at those places most bent, or at the most angular parts of each curve, to send out a shoot. This was taken advantage of, and is excellently illustrated, by Mr. Hitt in his Treatise on Fruit Trees; and had this and several other old treatises not been too much neglected, the late Mr. Forsyth's would not have been rendered necessary.

In training trees, few gardeners understand or avail themselves of the advantages which might be taken from this general law in the vegetable economy, that the extreme branches bent downward, or the extreme roots turned upward and exposed to the air, throw the tree more or less into fruit. I have lately seen it done in two instances by accident, where the effect was astonishing. The first was at Tynningham, where some pear-trees which never bore well, but grew vigorously, at-

* See Forsyth's Treatise on Fruit Trees.

tained the top of the wall, and were turned down upon the other side. This has been done two or three years, and every year those branches so turned down have borne immense quantities of fruit, and the other parts of the tree have begun to bear better. Were every other branch turned downward in this manner, either by bringing them over to the other side of the wall, or turning them downward upon the same side, the whole tree would soon become fruitful. The second instance was at Palatine House, where vines were grown in a pit, and trained from the top of the back wall, under the sloping rafters, to the lowest part of the front glass, and uniformly produced extraordinary crops of grapes, with a less than usual quantity of shoots. The good effects arising from the same principle may be seen in most gardens in a greater or less degree, at the corners of walls or espaliers, or around doors or other openings. Where trees are trained upon houses, it may be very frequently seen; the bends and twists, and downward training of the shoots, occasioned by the doors and windows, chimnies and projections, always producing this effect; and hence we often find trees in these situations afford more fruit than those in gardens. The excellent effects of cutting the roots of trees either at some distance or near the chief stem, and also the effects of cutting the stem itself, in order to throw them into fruit, have been fully recorded by former writers on horticulture, and have

been recently practised with complete effect by an excellent gardener at Woodhall.

Ablaqueation, or laying bare the roots of trees, is a species of cultivation nearly allied to pruning, and has the same tendency as the practice above mentioned*. I pass over many important particulars in this department of cultivation, and omit some branches altogether.

CHAPTER II.

OF THE CULTURE OF HERBACEOUS VEGETABLES.

These may be divided into three classes, viz. 1. The annual or biennial; 2. The perennial; and, 3. Salads and pot-herbs. The first class occupies the chief part of a garden; the two others occupy comparatively little space. To enlarge on the modes of culture applicable to the individuals of each class would in this place be improper, and indeed useless in a work of this nature, where only such hints are offered as may be in-

* See Miller's Dictionary, Evelyn's *Kalendarium Hortense*, &c.

teresting to gentlemen, or may tend to enlarge the ideas of the naturalist or amateur in gardening. What I have here to remark upon is, the important advantages to be obtained from cultivating the summer or late crops of the first class, annual and biennial kitchen crops, in the fields. The advantages are, 1. More wholesome and better flavoured vegetables, arising from the freshness of the soil and the open exposure. 2. The expence attending their culture is less, it being performed by agricultural implements, and consequently requiring little manual labour, and also less manure than in gardening. 3. Less manure being necessary in the garden, consequently more can be spared for agricultural purposes. Manure used in agriculture doubles itself every year; whereas that used in gardens makes scarcely any returns: the advantage therefore of employing as much of it as possible in agriculture is evident. 4. The last advantage consists in reducing the quantity of land destined for a garden; which, when this practice is to be followed, need never be so large as they commonly are.

The garden crops which may be best raised in the fields are all or most of those which are not sown before the middle of February in England, and the first of March in Scotland, and which are removed before those periods in the next year. Of this class are the principal crops of pease, beans, turnips,

carrots, parsnips, potatoes, onions, brocoli, and several others, which will grow perfectly well in the field, and with the same or similar culture as the turnip or potatoe husbandry. In all well regulated home or family farms there is every year a certain portion of ground allotted for turnips, potatoes, or other drill crops; now that allotment has only to be increased, and part of it used for the culture of these garden vegetables. When they were full grown, or when the turnips were to be eaten off by sheep, or otherwise removed from the rest of the field, that part of it under this culture could easily be inclosed by hurdles, which would preserve every thing safe during the winter. In spring it would no longer be necessary, and then the hurdles or temporary fence might be taken away, and the ground ploughed and sown with oats or barley, and grass seeds, &c. according to the nature of the rotation followed by the farmer.

CHAPTER III.

OF THE CULTURE OF FRUIT TREES AND FRUIT SHRUBS.

This is one of the most comprehensive and difficult branches of horticulture: it may be subdivided as follows; viz. 1. The culture of wall fruits; 2. The culture of espaliers; 3. The culture of standards; 4. The culture of the lesser fruits, or fruit shrubs.

1. The culture of wall fruits.—The first object of attention here is the construction, situation, and height of the walls, and general dimensions of the borders; but as these naturally belong to the general formation of a garden, I shall pass over it to the formation of the soil. With regard to depth: in dry situations, it may be three feet for most kinds; but in many cases two feet will be preferable; in such as are moist, eighteen or twenty inches is most proper, the bottom being paved or imbedded with a composition of loam and gravel, or rubbish of masonry, and forming a declivity southwards. The propriety of a shallow border on moist soils, and indeed in general, I have lately experienced in several striking cases, particularly

at Knowlesly; and it agrees also with what Mr. Hitt recommends and practised in making borders for fruit trees; several of which, when the subsoil was gravel or rock, were not above one foot in depth; and these he always found produced the largest crops, and by much the best flavoured fruit. The quality of the soil must vary according to the kind of tree to be planted. In general, it may be sufficient to observe here, that pears, plums, and apples, require rather a strong loam; cherries, apricots, figs, and vines a lighter; and peaches and nectarines a kind of medium between them; though, upon the whole, daily experience proves that all these sorts will prosper in the same soil, if other circumstances are favourable. In Dr. Monro's garden, at Slateford cottage, excellent crops of grapes, and indeed of most fruits, are produced from a strong clay; and in hundreds of places in Surrey equally good crops are produced from soils chiefly composed of sand and gravel. Apples and plums seem to prosper best in argillaceous soil, as may be observed both in the Clydsdale and Herefordshire orchards; though there are some kinds that prosper much better in a light one, as the paradise and oslin pippin and the drap-d'or plum *.

* The finest flavoured fruit in Normandy is found on very light and even shallow soils, which are the kind indeed that most generally prevail throughout all that province, as well as Picardy. Even the rich loam that covers the most fertile plains on the banks of the Seine abounds in small gravel and sand. Both that soil

The next object is the choice of proper kinds and good plants from the nursery. Upon the different kinds a great variety of opinions prevail. The kinds which generally prosper best in England may be found in Mr. Forsyth's Treatise, and those in Scotland in Mr. Nicol's. A good practice for gentlemen who are unacquainted with a great variety, is to observe those sorts which do best in the neighbouring gardens; and also to attend to the opinions of the most eminent nurserymen, who from their general sale of these trees, and intercourse with practical gardeners, are always well acquainted with the kinds most in repute. When the trees are planted, each may be numbered so as to preserve the name of the kind. This number may either be marked on lead or copper and nailed to the wall, painted on the wall, or registered by various other devices. With respect to good plants, every gardener knows the leading signs of health and vigour; viz. fullness, and well-formed buds in the extremities of the shoots.

The next object in the culture of wall fruit is their general management, which is too extensive and common-place to admit of any remarks here.

and its products, however, are very inferior to those of Herefordshire, notwithstanding what may have been erroneously said to the contrary. *Tour in France.*

2. The culture of espaliers may be considered under heads similar to those above. The remarks there made are all applicable here, except what relates to the depth of soil; for here several reasons concur to shew, that this ought in fewer cases to be less than twenty inches or two feet deep. The *construction* of espalier rails is perfectly simple; they should be fixed in masonry, and their parts under ground should either be charred on the surface or pitched, unless the whole be made of larch wood, in which case both pitch and paint are unnecessary. Espalier rails painted white have a harsh glaring effect in gardens; in all cases, therefore, they ought to be painted of some *quiet* colour, as brown, grey, or green. They are generally placed parallel to the walks on one side, as on those walks which surround the garden; or on both ends, as on those which cross through it. In both cases when the proper proportions are adopted, they have an excellent effect, especially in the cross walks.

3. The culture of standards. When these are placed irregularly throughout the garden, which is seldom an advisable practice, nothing can be said respecting the soil, as they must give way in that article to the general crops. But the best way of using standards (under which I comprehend all unfastened trees) is either in rows, as gooseberries commonly are, along the borders;—in quarters by themselves;—or in

orchards. Standards for borders in the kitchen garden should always be kept low, in order that they may shade the crops on each side as little as possible. But perhaps the best way is to have quarters for this kind of standards—to have them grafted on paradise or quince stocks, by which means they come sooner into fruit; and by the time those in the orchard or on the walls are in a full bearing state, these quarters are fit to be thrown out: and if requisite another quarter could be planted to succeed them. In this way, when a new garden was made, a tolerable supply of fruit might be had every year after the third; it being well known, that apples on paradise stocks, and pears on quince stocks, will frequently bear the second year after grafting, and very generally the third: and as those to be planted in the quarters would be three or four years old before they were removed from the nursery, they would commence bearing immediately.

Standards for orchards ought generally to be of the tall or high kind, and always grafted upon crab stocks.—See ORCHARDS.

4. THE CULTIVATION OF SMALL FRUITS, as gooseberries, currants, raspberries, &c. is commonly known. In the cultivation of red and white currants much depends upon pruning. They should be allowed to produce only from studs; and from

these, after the bush is four years old, the young wood should be wholly cut away every winter. This however is only applicable to standard currants, where large fruit is wanted; when currants are grown upon walls, and the object is to preserve fruit upon the tree from the currant season till the middle of winter, as is done in some places, the mode is to have the fruit rather smaller, and to have the tree large, and so much covered with fruit as to admit of few shoots. The former practice is excellently carried on at Duddingston, and the latter at Archerfield.

CHAPTER IV.

OF THE CULTURE OF CULINARY EXOTICS.

Among plants or fruits which in this country require artificial climates, the PINE first deserves attention. Much has been written respecting its culture, and much still remains to be done. The largest fruit and most uniform crop that I have ever seen was at Kelham House *. The soil in which they are

* In the year 1802 Mr. Griffin the gardener cut twenty queen pines, which weighed together eighty-seven pounds seven ounces:—in 1803, one weighing five pounds three ounces;—in July 1804, one of the New Providence kind weighing

grown is a stronger loam than is recommended by Speechly and Nicol, or used by any gardener as far as my observation has extended; from which, and several other particulars in management which I observed when there, it is probable some real improvement is effected in the culture of this excellent fruit. But for this I beg to refer to the Treatise which Mr. Griffin proposes to publish.—In the next chapter some farther observations will occur.

The general culture of the *vine** need not here occupy our at-

seven pounds two ounces;—and in August 1804, he cut one of the same kind which weighed nine pounds three ounces: these being the first and only two plants of the New Providence kind ever placed under his care." This is extracted from the Prospectus of a Treatise which he proposes to publish on the Pine.

* It may be remarked here, that the general imperfection of English grapes is their defect of saccharine matter and want of sweetness. This is, perhaps, in part owing to the humidity of the atmosphere, more than to its coldness; as very sweet grapes grow, and spiritous wines are made, in much colder and more northern latitudes than a great part of England. A very obvious remedy for both cold and moisture is the adoption of small glass covers, made with lateral openings in such a manner that they might be placed over the grapes and branch of the vine in any direction. Another reason why the fruit of English vines possesses considerable acidity, is the general taste for large globular grapes, without regard so much to the delicacy of their flavour, as the grandeur of their appearance. This species of vine does not produce delicious grapes in the hottest climates, and consequently ought not to be so generally cultivated in this. The grapes most abundant in saccharine matter are always small and round, as those of the *currant grape*. It must be confessed indeed, that the more exposed the vine is to the most intense meridian sun, so much the sweeter will be the grape, and the greater the quantity of saccharine or spiritous juice that it will contain.

tention (see Chap. III.); but some effects which maybe produced by particular modes of culture, though they are perfectly simple, and result from laws in the vegetable economy well known to every practical naturalist, may deserve to be mentioned. The first is, that when put into a hot and rather poor soil, as lime rubbish, brick-bats, and stiff vegetable mould, the growth will be limited, and the tendency to produce fruit greatly increased *. Hence vines of this kind may be cultivated like currant bushes, either in the open air,—under a frame or hand-glass,—or in pots which may be forced in a hot-house or conservatory, or placed when in fruit in the drawing-room, &c. A soil of an opposite kind, *free*, *porous*, and *deep*, such as rough sand and light loam kept moist, will encourage the growth of wood, and greatly lessen the tendency to produce fruit. Hence the advantage which may be taken of this in nursery gardening, where raising vines is an object, and hence also the advantage which may be occasionally taken from it in filling a large house with one plant. It is true, it would lessen the production of fruit for a year or two at first; but whenever the house was sufficiently covered with shoots, by removing part of the sand and free soil, adding some of a richer and more hot nature, and giving less water, the whole tree may be thrown

* This every attentive observer must have seen in the fields, whether in the growth and fruitfulness of weeds, common crops, hawthorn hedges, or trees.

into any degree of fruitfulness. Let me add here, that these two opposite effects of different soils afford excellent ideas for improving the soil of borders, either in the open air or hot-houses, and either with a view to make the trees produce more *wood* or more *fruit*. It is particularly adapted for vines and stone fruits; for cutting the roots of these, and especially of vines, is generally less successful, and is always attended with greater risk, than on other trees: of this I had lately a striking proof, by the shameful conduct of a gardener when about to leave his situation. Other particulars respecting the culture, training, pruning, and management of the vine might be mentioned, were it suitable to this work. In every topic or particular of vegetable culture there are numerous and important effects which may be produced by the simplest means, if we but advert to nature, from which the most important precepts in this branch of knowledge are obtained. But it is long before mankind, especially the practical part of them, can throw off the shackles of habit and prejudice; and thence any thing of a remarkable nature which is produced in these arts is commonly discovered or effected by accident. It is then either told to the world as a wonder or singularity—wrapt up under a dark receipt, like a quack medicine—or concealed, as an invaluable secret until a suitable reward be offered to the inventor. So contracted and imperfect are the general ideas of husbandry in this island, that even public bodies of the first importance have

been imposed on by these quack cultivators, both by men bringing forward practices recorded by old writers, and by others recommending things of no real use.

MELONS AND CUCUMBERS next demand attention.—They are generally grown upon hot-beds, or in pits, which will be noticed in the next chapter. Considerable art and constant attention are requisite to have them early. Much depends upon the steadiness of temperature and kindly moisture of the atmosphere in the bed, and much also upon the soil employed. Considerable improvements might be made in the culture of these fruits, by adopting in certain cases the same general principles which have been noticed above in treating of the vine, and particularly in late crops. In hot-houses, cucumbers may be preserved in a bearing state during the whole winter, as is practised at Knowlsely and several other places. The culture of the PASSIFLORA QUADRANGULARIS, or apple bearing passion-flower, is nearly that of the vine. The chief difference is, that it requires to be preserved in a growing temperature during the whole year. This is easily effected, by planting them in pine stoves or hot-houses. One plant bears an immense quantity of fruit; and as these are of an agreeable taste and flavour, and have a beautiful and uncommon appearance, one or two plants will have a good effect if introduced into hot-houses. That number, however, is abundantly sufficient for any family; as it

is still far inferior to the other exotic fruits that have been mentioned. They may be seen in great plenty at Harewood Hall, and the botanic garden of Liverpool.

The CACTUS OPUNTIA is said to produce a fruit little inferior to the pine apple. It may easily be raised by a similar culture, but with a greater degree of dry bottom heat. It certainly demands a trial from the curious epicure.—See JUSTICE's British Gardener.

As ORANGES are generally cultivated for show, they are referred to ornamental gardening. The best directions will be found in "The Retired Gardener," and the best fruit and trees in this country may be seen in the garden at Woodhall. There, every species of oranges, lemons, limes, shaddocks, &c. are cultivated in a variety of ways; and, with a degree of success, hitherto unparalleled in this kingdom.

CHAPTER V.

OF FORCING VEGETABLES INTO A STATE OF GROWTH OR FRUIT AT PARTICULAR OR UNNATURAL SEASONS.

THIS is effected either by operations upon the vegetable when in its natural climate, upon the soil in which it grows, or by removing it into an artificial climate.

1. FORCING, BY OPERATING UPON THE VEGETABLE OR THE SOIL, is done in various ways, and from different known facts in the economy of plants. The simplest mode of forcing is by sowing or planting at an uncommon season; that is, either later or earlier than usual. The next is, by placing the vegetable in a *warm and dry* or *cold and moist situation*, or in a hot or cold soil*; by which it either comes into perfection later or earlier than if placed in the medium between these two extremes. The essences of every vegetable are its flowers and fruit; and every individual species grows, or has a continual tendency to grow, until it produce these in perfection. Annuals in general do this the same season in which they are sown;

* See CHAPTER IV.—VINE.

perennials, the second or third season, and once every year afterwards; trees and shrubs frequently do not show flowers for several years after they are sown; but when once they have begun, they do so regularly every summer afterwards. Now by taking proper advantage of these known facts, considerable effects may be produced, both in the way of forcing vegetables, and rendering them more useful. Thus, by preventing *annuals* from coming into flower the first year, which can easily be done by removals or cutting them over near the surface, they will live, unless in too cold a climate, till next season; and if the same operation be performed on them the second year, they will live for a third: and so on, sometimes for a number of years; in almost every case for two, and often for three or four years. In this way, by mowing tares or barley, two or three green crops may be obtained in one season, and a very early one be produced the next. By the same means annual rye grass is made to last two or three seasons; and on good soils is frequently, by being pastured afterwards, made perennial. In the kitchen garden, *plants* of cabbage, savoys, greens, &c. which are annuals, are frequently preserved the first season under one foot high, and by being planted in autumn, or immediately before winter, produce either a late crop that season, or a very early one the next. Parsley also may be made to last some years, by being cut over before it begins to bloom, &c. In perennials by cutting over the artichoke, sea-cale, or asparagus, early

in the season, a late autumnal or winter crop may be produced; and if we take all the blossoms from a strawberry-plant in April, it will produce excellent fruit in November following. In trees and shrubs, by depriving them of their leaves and flowers in spring, or the beginning of summer, they will produce these at different periods, according to their nature, from August to February; and if protected from the inclemency of the weather at these seasons, would produce fruit. This is easily done with raspberries, currants, gooseberries, and strawberries, as they come into fruit (as I have found on trial) in October and November, and do therefore require little covering. But with most other fruit trees the period is later; and not only is a covering requisite, but the tree is often so materially injured as to be good for little during some years afterwards; and sometimes it dies altogether at the time.

Another method of *forcing* or producing fruits or vegetables at uncommon seasons is by preservation. Thus currants, some species of green gooseberries, cherries, &c. may be preserved until Christmas, by being covered with mats or cloths, either thrown over the bushes and borne up by them, or fixed on proper frames made for the purpose. Roots are preserved in sand or earth, as carrots, potatoes, &c. &c.

2. FORCING, BY REMOVING VEGETABLES INTO AN ARTIFICIAL CLIMATE, is performed by means of glass-houses, or glass-cases, heated either by fuel fire, the heat of steam, or the heat of putrefaction or fermentation. In every case, the great art lies in imitating natural climates as to light, dew, rain, heat, air, wind, &c.—For the modes of accomplishing this object, see the next chapter.

CHAPTER VI.

OF THE CONSTRUCTION OF HOT-HOUSES, HOT-WALLS, PITS, HOT-BEDS, AND MUSHROOM-HOUSES.

THAT the construction of hot-houses is very imperfectly understood among those who are generally employed to erect them, will appear evident to any one who shall investigate the subject in the slightest manner. Nor will this appear surprising, when we consider how very recently they have become general in gentlemen's gardens. It is presumed that there were few green-houses in England before Mr. Evelyn erected his con-

servatory at his seat near London. Now the same general form was implicitly followed till within these few years past*: not indeed exactly the same construction; for certain iron pipes, which Mr. Evelyn ingeniously, but rather unsuccessfully, introduced for the purpose of supplying heated air, have been rejected; and this has been done evidently without that enquiry into their intended use, which was due to every scheme devised by that great man. Mr. James Justice, of Crighton near Edinburgh, erected the first pine-stove in Scotland; and if we observe the plan of this hot-house, as given in *Justice's British Gardener*, we shall observe little or no difference, either in the principles of construction or external appearance, between it and those in general use at the present day.

With respect to books on hot-houses, there has never yet been published any thing in the way of inquiry into the principles of their construction and general management. Mr. Evelyn, in describing his conservatory, gives two or three hints respecting the properties and management of air which are deserving of attention. But in the several books of designs that have been published, not a sentence is to be found respecting the principles, or even the properties, of the designs recommended.

* Of this any one may be convinced by examining his Kalendarium Hortense, 10th Edition.

Indeed, these designs are impracticable, and such as could not answer the purposes of horticulture: the natural consequence that ever follows hot-houses designed by mere architects or builders*. The plans given and recommended by *Steel*, *Abercromby*, *Speechly*, and others, answer better; but they contain no deviation from general practice, to entitle them to claim the merit of making improvements in their construction. Indeed, it evidently appears, from the writings of these men, that they were unable to think accurately on the subject. The same remarks are applicable to the designs lately published by Mr. Nicol in his *Forcing Gardener*; but it is with pleasure I remark, that these designs, though exactly upon the same principles with those mentioned above, are perhaps upon the whole better adapted for the purposes of forcing. To Dr. Anderson the public have been indebted on many occasions; and horticulturists are eminently so, for the many ingenious hints contained in the account of his patent hot-house. This small volume is certainly of more real importance than all the designs or books on the subject that have preceded it. But though in some of the warmest counties of England the Doctor's hot-house may perhaps succeed for a year or two after it is erected, it is the humble opinion of the author that it will never come into general use.

* For we have many of these, but very few qualified to assume the former title.

In different parts of the island there are, and have long been, peculiarities in the construction of some hot-houses, which, had they been understood and attended to by planners, would long ere now have made a material difference in the general design and erection of these edifices. At Abercairnie, near Crieff in Perthshire, heated air introduced by a vacuity around the furnace has long been used to heat a peach-house. Now though the manner in which this is effected is extremely simple, yet the end is answered in a considerable degree, and a tolerable saving of fuel produced. I am also informed, that heated air was in the same manner introduced into a hot-house in the neighbourhood of Manchester near forty years ago; and as it is probable that there may be some other cases in England which have not yet come under my observation, it is likely, however strange it may seem, that the practice may be traced as far back as Mr. Evelyn's time. I only mention this to shew how very little men generally think upon what they hear or see, and how prone they are to persevere in old common practice. This improvement by heated air, having escaped the attention of planners (who must have seen or heard of some of the instances mentioned, but who evidently have not understood its nature) would have been lost to the public had not a Mr. Stewart, gardener at Woodlands, brought it boldly forward to public notice in his patent hot-house. Mr. Stewart deserves much credit for this; and it is to be hoped he will find such a demand for his

kind of patent hot-house as amply to recompense his talents and industry.

Reflecting upon these various improvements, in connection with a great number of experiments and observations made at Dalry*, I conceived the plan recommended in my treatise on hot-houses, for heating them; and by thinking on the subject in a free and unprejudiced manner, and studying the nature of heat, I conceived the idea of an inner roofing, an invention of immense use in their management. These improvements were first tried experimentally upon an old hot-house in Broughton Park Nursery, Edinburgh; where, although several things were ill executed, still the effect was so astonishing, as to encourage me to prosecute the ideas I had conceived. I have now, after considerable practice in designing, and seeing them constructed, fixed on improvements which appear to me much superior to any adopted, or at present known in Great Britain. They are perfectly simple and practicable, and will not only save much fuel, but greatly lessen the risk of over-heating or over-cooling the house, and will also require much less attendance

* Dalry, in the neighbourhood of Edinburgh, was then the property of John Mawer, Esq. an eminent horticulturist and ground architect, who had at that time, 1796, the most extensive range of hot-houses and steam apparatus in that part of the country, as well as a very extensive practice in planting, building hot-houses, forming gardens, and laying-out grounds. The author had the honour to be his draughtsman and general superintendant for the three years previous to his death.

from the gardener, and none at all in the night season, as is frequently the case with those in general use. In England these improvements may be seen at Palatine House, Trigger Hall, &c. In Wales, at Havod, where ten large hot-houses are altering according to the author's mode. In Scotland, at Mr. Smith's, Leith Walk, Broughton Park Nursery, Macheny, Glenfuir, and several other places. To enter fully into them in this work is unnecessary; but a few general hints are what the nature of my purpose demands, and they shall therefore be given as concisely as possible.

1. Hot-houses. The chief agents in vegetation, and which demand attention in the construction of hot-houses, are *heat*, *soil*, *air*, *light*, *water*, and *wind*, or motion. *Heat* is generally produced by fuel, which is consumed in a furnace, and the heat and smoke conducted through the house in a flue or horizontal chimney. It has occasionally been done with steam, either alone, or jointly with fire; but this is much too expensive for general use; the only advantage which attends it is, that a house at any distance from the boiler may be raised to the same height as one close to it: an advantage of little use in gardening, though in heating houses or rooms from a kitchen range, &c. it might be of service. Heat may occasionally be communicated by fermentible or putrescent matters, such as dung, litter, leaves, moss, or other vegetables fit only for

being changed into manure. In some cases, it may also be generated by the sun, (as in Dr. Anderson's patent hot-houses,) and preserved in proper compartments, though probably in very few situations. All modes may occasionally be employed, or taken advantage of, in particular circumstances; but that by fuel, furnaces, and flues, is the only plan capable of being put in general practice with advantage. The greatest difficulty that occurs with heat is its management, so as to retain and regulate its degree agreeably to the nature of the climate to be imitated. It is retained partly by having the house made as nearly air-tight as possible, and partly by an inner curtain invented by the author, which is let down during night immediately under the glass, and which, by preventing the heated air of the house from coming in contact with the glass, permits only a very small quantity to escape. It is preserved at the proper *regulation* chiefly by this curtain, which, as it retains the proper temperature, does not require the heat to be greatly raised at the beginning of night in order that it may not be too low in the morning, as is the case in all hot-houses where a curtain is not in use. For be it observed here, that though the house be perfectly air-tight, yet as glass from its porous nature is easily permeable by either heat or cold, and consequently as heated air always ascends to the top of the house, it must be continually given out to the atmosphere through the roof as well as sides of every glass hot-house. And this is the sole

reason why hot-houses with glass on all sides are so difficult to manage without this improvement.

Soil is obtained either by inclosing a portion of the ground surface, and preparing it in a proper manner; or by placing it in pots or boxes, which may be removed or altered at pleasure.

Air, it is almost unnecessary to observe, is inclosed, and can be excluded, and fresh air admitted, either wholly or to mix with it, by having apertures at different places, which may be opened or shut at pleasure.

Light is admitted by constructing all or part of the roof, or even the sides and the roof together, of glass frames.

Water as such, that is in its fluid state, is easily given to the plants by pouring it on the ground only; as *rain*, it is given by the syringe, or engine, or watering-pot; and as *dew*, by pouring it upon hot masonry, such as the flues, by which it first ascends as steam, and then descends, on parting with its caloric, as dew.

Wind, which has two effects, that of putting the plants in *motion*, and *removing stagnated air*, is produced by admitting a

current of external air. As this can only be done with propriety when the external air is nearly of the same temperature as that of the house, it is evident that vegetables grown in hot-houses must be great part of the year without this invigorating motion. I have attempted by several methods to produce a motion of the air of the house alone, by means of ventilators of different kinds, and which might produce wind, or a breeze, to exotics at all seasons of the year. I have hitherto, however, been unsuccessful, except in some particular houses where a good deal of room could be obtained; and then wind may be produced by putting in motion several large boards, which may be fastened on one side, by hinges, either to the back-wall, front glass, or roof.

After these general remarks on culinary hot-houses, a few observations shall be added on the particular kinds. These arrange themselves into three classes: 1. Those for peaches, nectarines, cherries, figs, &c. 2. Those for vines. 3. Those for pines.

1. Those for *peaches* and similar trees, where the climate is cold, are with propriety placed against walls, and formed of glass on one side: but where it is moderate, as in most parts of England, a house formed of glass on all sides, and with the trees planted and allowed to grow irregularly as standards, will

Fig. 1.

Surface Plan of a Pit for forcing Vegetables or growing young Pines upon a new principle.

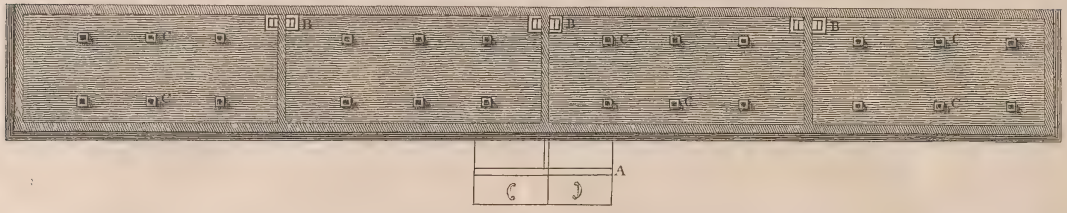
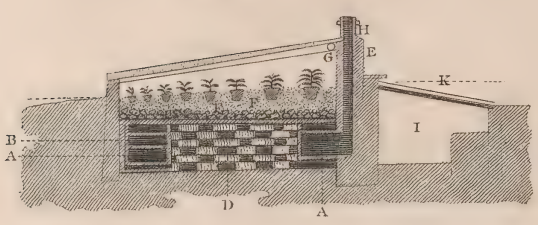
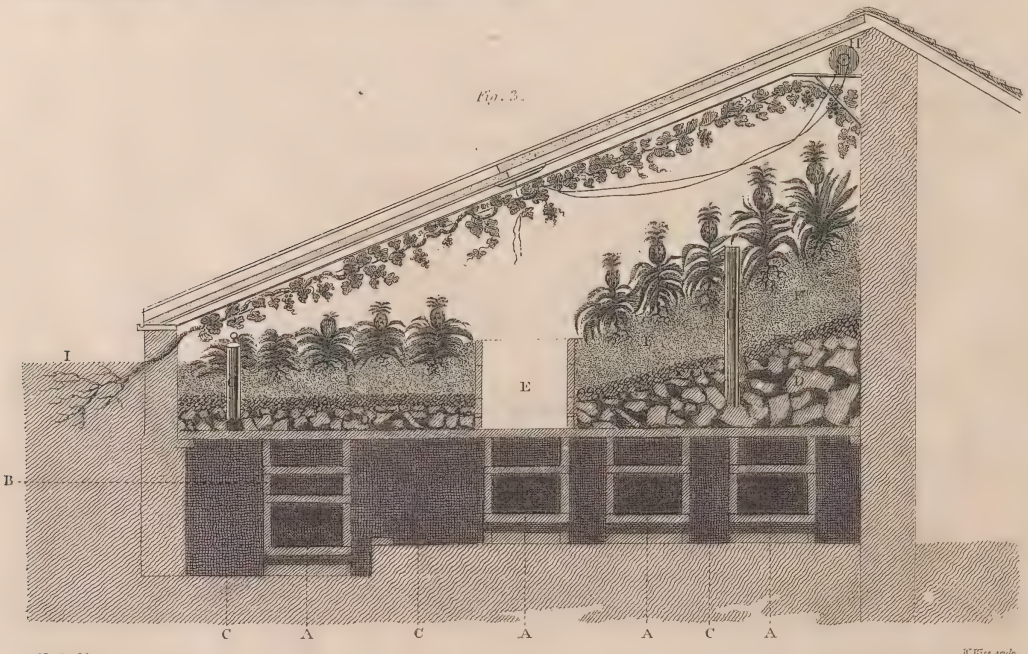


Fig. 2



Section of a new Invented Pine Stove.

Fig. 3.



J. London del. *W. Wise sculp.*

Published May 31. 1806. by Longman, Hurst, Rees & Orme, Paternoster Row.

be found preferable and more beautiful; the most decisive proofs of which I have given from facts which took place at Dalry. See the Treatise on Hot-houses, page 186.

2. Those for *vines* may be of any form, and large or small according to the period at which they are intended to be brought into fruit. A double roofed house, with an inner roofing, will always be found most economical for a general crop. Vines clothed with foliage, and enlivened by bunches of fruit, are so beautiful and accommodating, that they should be introduced into every kind of glass-house in a greater or lesser degree.

3. *Pines* are commonly grown at an immense expense, incurred chiefly by the tanner's bark and leaves, which require such frequent renewals, and occasion so much labour in moving and replacing the plants, &c. This, with the risk which always attends heat added by fermentible substances, has discouraged many from growing them. In the treatise already mentioned, I have described and delineated a plan which would almost entirely remove these objections. I am now happy in being able to refer to a house constructed by me upon the exact principles, viz. the pinery at Prinknash; I shall here only refer to Plate 11. fig. 3, which is a section illustrative of the mode adopted, and may serve to impress the plan upon the memory of the reader. AA A are the smoke flues; B the air flue; C a

large vacuity of heated air; D the rubble stone vacuity; E walk in the centre; F earth in which the plants grow; G steam and air tubes; H inner roofing; I surface of the ground, &c. See the *plan*, *sections*, and a full description in the "TREATISE."

2. HOT-WALLS. The formation of these consists of two parts: the construction of the flues and furnace in the wall; and the construction and contrivance of a covering of canvass, or netting, to be let down over the trees in severe weather, and during night. The construction of the flues, so as to distribute the heat equally over every part of the wall, is perfectly simple and need not be insisted on. The fronts of these flues should be made at least a brick thick to preserve that heat. The proper furnace is that recommended* for hot-houses in connexion with a damper; the great superiority of which in hot-walls I experienced in a striking degree at Mr. Smith's hot-wall, Leith Walk. In contriving the covering of Scotch gauze, or small netting, small rafters must be fixed to the top of the wall, and to the border, about three feet from the roots of the trees. Along the lower ends of these rafters, the roller for containing the covering must be fixed. By cords and pullies this covering can easily be drawn up to the top of the wall, or rolled down, as occasion may require. Wherever a hot-wall is con-

* Sold at Cooke's Foundry, Theobald's Road, Holborn, London; and the Edinburgh Foundry Company, Edinburgh.

structed, this covering should not be neglected, as is too frequently the case; it being of very great importance in preserving the heat, and preventing chilly dews, frosts, &c.

3. Pits are constructed upon the same principles as hot-houses. They are of great use in raising crops of culinary exotics, as cucumbers, &c.; in forcing common vegetables, as asparagus; in raising young exotics, as pines and other plants; or in producing grapes. For the general purposes for which pits are constructed, I shall beg leave to recommend one invented by me, and erected on a small scale at Glenfuir; which, with only one fire, is capable of producing four different temperatures at the same time; and, consequently, of forcing all kinds of common vegetables, and growing vines, pines, and melons, each in their proper climate, with one fire and little trouble or expence. It will be found described and fully delineated in the Treatise on Hot-houses; and some idea of its appearance may be formed from Plate XI. fig. 1., which is a surface plan of it: A represents the cover of the excavation containing the furnace; B the air registers, which assist in producing the different temperatures; C the air and steam tubes, by which heated air is admitted from the rubble stone vacuity, and steam produced by pouring in water, &c. Fig. 2. is a section of this pit; which shews A the smoke flue; B the air flue; C the chimney; D the supports of the rubble vacuity; E the rubble

vacuity; F the earth and the plants; G the inner roofing rolled up; H the damper; I the furnace-hole; K the cover of the same; L the surface of the ground, &c. The advantages that would result from this pit, not only in producing earlier and better crops than those in general use, but also in saving much time, labour, and annual expence, bestowed on forcing-houses and hotbeds of all kinds, while they demand the attention of such gentlemen as indulge in these luxuries, are also of importance to the agriculturist. By substituting them for hotbeds (and one of them, a hundred feet long, would surpass a dozen of these) the disorderly appearance of dung and litter in a garden would be avoided, and much stable manure saved, which could be applied more advantageously to the reproduction of vegetables, by permitting it only to undergo the proper degree of fermentation; for I may here observe, that after dung has been nearly a twelvemonth in a hotbed, as every chemist knows and many farmers have experienced, it loses a great proportion of its nutritive qualities. But besides this advantage, there is another of no small importance, and that is the formation of composts with peat or other matters, as I have formerly mentioned under Agriculture. Though the plan given in Plate XI. fig. 1. and 2. be chiefly recommended for forcing common vegetables, and growing young pines, cucumbers, &c. yet by avoiding the erection of any thing except the smoke and air flues, and by placing a trellis about eighteen inches under the

glass, without any other expence, the quadruple compartments will make four excellent vineries, which may be brought into fruit at the same number of periods. The general principle of forming vineries in this manner will be found to answer equally well with those raised above the surface and placed against walls, and they may be executed in the first instance at *much less expence*.

4. Hotbeds are commonly formed of stable manure; either alone; mixed with bark, moss, or coal ashes; with bark or moss in the centre only; with brushwood and ashes in the centre; or with turf, sand, or ashes on the top under the earth, &c. They are also occasionally formed of masonry, or brick-work, and surrounded by dung, as in M^c^Phail's mode of cultivating the cucumber; whose practice and hotbeds answer well for early forcing, especially in England. This subject, however, being more connected with the cultivation of a garden than the formation or design of it, I shall leave it to gardeners, it being generally their favourite business.

5. Mushroom-houses require little ingenuity. If placed in a dry situation, they can seldom fail to answer. They may easily be contrived so as to be forced into perfection at all seasons. The erecting of houses on purpose for them, however, is seldom requisite: an empty shed, barn, cottage, or cellar, are generally the places in which they are raised.

CHAPTER VII.

OF OTHER BUILDINGS REQUISITE FOR A KITCHEN GARDEN.

SHEDS for implements, flower pots, hotbed frames, glass-sashes, or for working in during rain or stormy weather, are requisite in every garden; they are generally placed behind the hot-houses, and serve at the same time to contain the furnaces, fuel, &c.

The SEED ROOM and FRUIT ROOM should generally be erected adjoining each other, and placed near the hot-houses; as should also the gardener's house, and most other useful buildings.

COVERED SEATS, ornamental ROOMS or RETREATS, may either be made in different quarters of the garden, in the centre, in the angles as at Aimsfield, or in the range of hot-houses, as at Twickenham and several other places.

The particular design and construction of the useful garden buildings are so well understood, that it would be absurd to add any thing on the subject. The last class should be contrived in conformation to the style of the garden, the place, and the proprietor; and may be erected from designs as diverse as they

are numerous, and of every degree of elegance, from the bower of honeysuckle, hops, or vines, twined upon bent poles, to the Grecian porch or temple of the finest masonry. Great caution is requisite, however, in admitting ornamental buildings into a kitchen garden. Even in them, as in every thing else in the garden, *use* should be the prevailing idea. But *use* and *beauty* go hand in hand, and the most vulgar objects may be dignified by the judicious introduction of elegance. A kitchen garden, though unmixed with productions purely ornamental, is still a pleasing scene, because full of *utility* and *animation*, and always varying both from the practice of cultivation and the seasons. It is, therefore, very generally resorted to at most times of the year, and particularly early in spring. In our variable climate, whenever walks are frequently used at that season, there should be covered seats, and these seats should correspond with that whole of which they are conspicuous parts.

CHAPTER VIII.

OF THE FORMATION OF ORCHARDS.

ORCHARDS, with regard to formation, may be divided into two kinds: *Family orchards*, which are a necessary appendage to every good residence; and farm or market orchards, which are peculiar to certain counties, or the neighbourhood of great cities. The soil of both kinds should be strong, and the situation sheltered, either naturally, or by means of forest planting. Natural shelter is produced by the variations of the grounds surface, and prevails chiefly between the high banks and holmes of winding rivers, as the Wye, the Clyde, &c.; or by woods already full grown. The exposure is likewise generally best in these situations; which arises both from the declivity and exposure of the north banks to the sun, from the reflection of the opposite banks, and the stillness of the atmosphere, which in these situations is little affected by the wind. In forming family orchards, whenever the side of a dell or river, or a naturally sheltered declivity, occurs, it should be preferred. It is too common a practice for gardeners to fix on level places, or regular slopes, on account of their more garden-like appearance;

and to attempt producing shelter by planting, which never can be fully equal to that which is natural. It may be farther added, in favour of the other situations, that the soil is generally of the best quality for fruit-trees. In most places different species* of fruit-trees may be advantageously introduced, either in groups, or among other plantations in the park or pleasure-ground; and it is highly probable, that the improvements in the form of the tree, and colour and quality of the fruit, which will result from Mr. Knight's experiments and inquiries into this subject, will render these trees much more interesting in such situations. Farm orchards are highly profitable for sending the fruit to market, as in Clydesdale; and for

* It is extraordinary, that practical men have not more particularly recommended the cultivation of *mulberry trees* in this country, where they succeed so well, and produce such excellent fruit. These trees are not only of great importance as furnishing food to the silk-worm, the breeding and rearing of which might become a delightful and profitable source of amusement to ladies during their residence in the country; but they are also capable of being made of national utility by the wine that could be made from the juice of this fruit. Whoever understands a little of the theory, and somewhat of the practice of making wine from grapes, could make a very pure delicious wine from mulberries; and if it be remembered, on the one hand, what enormous sums of money are annually given for wines to a country that will probably long be our rival and enemy under every form of government; and on the other, the various foreign matters, dangerous to the health, that are used in the manufacture of artificial wines; it is surely no less desirable than patriotic to endeavour to raise a very salutary and highly delicious substitute entirely of *English* growth. It is not an exaggerated calculation to say, that in the course of a very few years half the consumption of the united kingdom might be supplied with mulberry wine; and it has naturally most of those qualities particularly relished by Englishmen.

making cyder, as in Herefordshire, Worcestershire, &c. Wherever they occur, they afford an excellent subject for a *ferme ornée*; since no species of culture can be more beneficial and profitable. An instance, which I flatter myself will prove this in a few years, came under my practice at Hopton Court. I have in several places in the course of practice introduced fruit-trees in groups, sheltered hedgerows, and plantations.

CHAPTER IX.

OF THE GENERAL FORMATION OF A GARDEN.

THE first and most essential requisite, in fixing on the situation of a garden, is a good EXPOSURE. Soil and shelter may be improved, and often entirely changed; but exposure generally remains for ever the same. The best exposure for a garden is the south-east; but in an extensive and complete garden, it would be desirable to have part of it with a northern aspect, to raise late crops. This can frequently be obtained, by fixing either upon both sides of a gentle eminence, or the two opposite sides of a hollow. If this hollow wind considerably, every

kind of exposure would be at once obtained, and generally in connexion with shelter and a good soil.

The next requisite is SHELTER. Natural shelter has been already treated of, in the preceding chapter: where that cannot be had, and the garden can neither be placed in a natural hollow nor in a wood, recourse must be had to planting. This should be done on all sides of the garden, and near to, or distant from it, according to circumstances. When the garden is on a level, the nearest forest trees should not, generally, be closer to the outer fruit wall than a hundred feet; and on the south side twenty or thirty more: but when it is on a steep bank, they may frequently approach within fifty or sixty. In most cases, a deep sunk fence should be made between these trees and the garden ground, to prevent the roots from too freely pasturing in the surface soil. If the trees are of the fir kind, which make the best shelter, this will be particularly requisite. It is a common and dangerous error, to place gardens in too low situations, for the sake of present natural shelter; but hoar frosts, mildews, and blights, seldom fail of being attendants. A number of such gardens could be pointed out both in England and Scotland.

The next requisite is SITUATION; which chiefly refers to its connection with the rest of the place, and with water. It

should be, if possible, near to the family offices and livery stables, and not far from the farm; at the same time it ought to be concealed from general view, and, if possible, so contrived as not to interfere with picturesque improvement; which they frequently do when unguardedly set down. With respect to water, it should in every case be so near, and in such abundance, as that no scarcity of it for the common purposes of watering may take place in the summer months. Frequently, water may be used after the manner of irrigation, either by making it pass under the garden through a porous substratum, or distributing it over its surface by means of troughs * and pipes, as already mentioned †. Both ways are practicable when water can be commanded: and where the surface is either a uniform slope or level, the expence would be very trifling, and the advantages certainly considerable. I have seen a great number of gardens where it might be put in practice with very little trouble, and perhaps none would be more improved by it than the garden now forming at Luss.

The next requisite is PROPER SOIL; which some will imagine ought to have been placed before Situation. But the soil can

* These should be removed in winter, and in time of frost; no water should touch a garden in winter that can be kept off; even rain, if it were possible to prevent it, should not fall on it; water produces cold by its *evaporation*, and in the process of congelation.

† See Chapter I.—CULTIVATION.

generally be altered at pleasure; whereas situation, shelter, and exposure, cannot. Shelter indeed may be improved in the course of time, but frequently not during the life of the owner. Soil however can, though with considerable expence, be altered in a few months. The best general soil for a garden is a *middling loam;* which, in some parts, can be made of different degrees of lightness, to suit different vegetables, by the addition of sand; and in others, of different degrees of stiffness or cohesion, by the addition of clays. The depth of garden soil in general, where the bottom is dry, may be considerable, and not less than three feet; where the bottom is a moist clay, a less depth will be requisite, especially if that clay be well drained; but if this cannot be accomplished, nor the expence of placing a stratum of gravel above it incurred, then it should not be less than four feet deep, in order to prevent the roots of herbaceous vegetables from reaching it. For fruit trees such a soil would be ruinous, without pavement at two and a half or three feet under the surface. When the natural soil has to be removed, and a new soil formed, regard should be had to the introduction of different kinds of earth; and particular care taken to form the fruit tree borders of proper depth and quality, and with proper substrata.

After these remarks on choosing the site of a garden, I add a few on its general *form* and *subdivisions.*

The *form*, which is determined by the walls, is best calculated for the general purposes of horticulture when it is that of a parallelogram. Though, if the production of wall fruit were the prime object, an oval form, with its long diameter from east to west, would be preferable; as it would contain the smallest quantity of wall hid from the sun, and at the same time a considerable portion of it would be always exposed to the south. But as all forms, except the square kind, derange the regulation of the quarters, and consequently would be particularly troublesome in digging and cropping, they are generally and very properly disregarded, except in some kinds of flower gardens, where fruits are cultivated upon the walls*. The outer inclosure or boundary of a garden may either be a sunk fence and hedge, or a sunk fence and low wall. Between that and the garden wall, a space of from forty to ninety feet should be reserved for common crops in the north side of the garden, and for early ones on the south. In several cases, a shrubbery may occupy a part of this space toward the plantation, forming a phalanx of varied vegetation, from the lowest shrub at the walk's edge, to the tops of the forest trees. This will make a very complete shelter, and have an agreeable appearance at most seasons.

* Frequently, however, when flower gardens which are to have fruit upon the walls are formed, ignorance of culture, and want of ingenuity in the Designer, induce him to be content with common forms, as in that mass of deformity called a flower garden at Valleyfield, and also that at Douglass Castle.

Often, however, a single holly hedge upon the top of the sunk fence may supply its place, and then a greater portion may be allotted to the growth of kitchen vegetables, and the general character of utility be better preserved. Sometimes it fortunately happens, from the declivity of the ground to the south, that the regularity of this outer inclosure can be broken, and a large bay or recess made in the wood, either to contain all the hot-houses, hot-beds, &c. or to contain the hot-beds only. Where this can be done, it is a great advantage; but regard must be had to the shadows which a high north wall projects in winter when the sun's rays are nearly horizontal.

Within this space or outer border is placed the fruit-tree walls; and the space within these is subdivided into borders and quarters by walks, alleys, espaliers, rows of trees, and hedges. Wall borders should, in general, be of the breadth of the wall's height; espalier borders the width of the walks, or of the espalier, which ought to be in unison. When walls or espaliers are very low however, the former perhaps under ten, and the latter under three feet, this rule will not apply. Quarters, if not so small themselves, should be subdivided into spaces not more than a hundred feet broad; their length does not signify, as it can be varied by rows of trees, bushes, or, what is frequently preferable, the mode of cropping alone. Walks, as to direction, should surround and cross the garden,

always intersecting one another at right angles. This should be done in such a manner, as to form a border on each side of the walls, and to form quarters of convenient size, &c. The garden may be subdivided by walls similar to that which surrounds it; or by hedges, which produce better shelter. The breadth of walks and the height of walls must depend upon the extent of the whole. Walls should seldom be made lower than twelve or thirteen feet, and never need be made higher than sixteen, except for hot-houses. Walks in kitchen gardens should seldom be narrower than five feet, and very seldom broader than fifteen; ten or twelve feet is generally a proper breadth for extensive gardens. Espaliers are commonly, and very properly, placed parallel to the walks, both round and across the whole garden. Rows of fruit-trees are placed across it to produce shelter, or irregularly in the quarters, to effect variety; but this last practice is seldom advisable. Hedges are perhaps too little used in modern gardens. In exposed places, they are much to be preferred to walls for subdivisions. Walls, in such situations, produce violent currents and eddies of wind; but hedges only soften and refine it as it passes through them: besides, the beauty and grandeur of high holly hedges, when contrasted with brick walls and the red gravel of the walks, is certainly another recommendation which ought to have some influence, though utility were out of the question.

Culinary hot-houses may be placed against the south side of the north wall as usual; or, if a convenient space can be found, without the walls; where the whole of the forcing-houses, pits, and frames, may be placed together. When this is not the case, the pits and hot-beds should be placed in a sunk area in one of the quarters of the garden, and not far distant from the hot-houses.

In a complete and magnificent residence, the kitchen garden ought to be laid out at first, and managed ever afterwards, with a view to the cultivation and production of culinary fruits and vegetables only. No green-houses or plant stoves, flower-borders, roses, or parterres, should be introduced; but utility should be predominant in every part. In many cases, even the edgings of the walks should be made of strawberries*, parsley, or other useful plants; and in place of holly hedges, double rows of espaliers or standard fruit-trees. In a complete residence, the flower-garden, green-house, and plant-stoves, should be entirely by themselves. In a less magnificent residence, however, they may be, or at least are commonly, intermingled; and when the flowers and shrubs introduced in the borders are

* Strawberries always produce best in this situation, though in most cases box is preferable; for what is gained by the fruit of the strawberries, is lost by the extra labour of preserving the earth of the border from mixing with the gravel of the walk.

of commonly cultivated kinds, or annuals, utility is not much frustrated, and the effect is not strikingly incongruous. But when rare or uncommon sorts are introduced, they require such careful and diversified culture, that the general use of garden ground, and the pulverization of the soil for the growth of the trees in the borders, cannot be sufficiently attended to; and with regard to beauty or taste, there is such a contrast between the state and appearance of a wild plant grown only to amuse the botanist, and the monstrosity of cabbages, turnips, fruits, and even roses, lilies, and pinks, that in place of producing variety or harmony, which moderate contrasts will do, it produces discord, and thence excites disgust.

There was once in this country a kind of gardens where beauty, grandeur, and use, were mingled in a way at present unknown, or nearly forgotten. In them terraces, green slopes, ballustrades, stone steps, ponds, statues, arbours, high hedges, and other architectural and aquatic decorations, were mingled with fruit-trees, flowers, herbs, and culinary vegetables. The union of so many different things was certainly in a high degree unnatural; but it was so fully avowed, and was so completely blended and harmonized by the appearance of great art in every part of the garden, and by the immediate vicinity of the house itself, that they must have produced a whole agreeable to good principles; and as pleasing to connoisseurs at the time,

by its contrast to the general appearance of the country, as the ideas that we have of them and the fragments which still exist are gratifying to us from their antiquity and rarity.

The cultivation and yearly management of a garden includes a great variety of matter highly interesting and amusing to those who take delight in a country life. It has occupied the leisure hours and the pen of a Bacon, an Evelyn, a Temple, and a Boyle, and therefore is not unworthy the attention of their countrymen. There still remains much room for experiment and observation, and much need of shewing the application of those facts already known. It is astonishing to observe what trifling evils are reckoned insurmountable, or are attempted to be removed by unsuitable or totally inadequate means. I have often seen, and daily see, great labour and expence bestowed to render ground or trees fruitful, which, if the simplest facts were adverted to, might be done much more completely with scarcely any trouble.

BOOK I.

PART VI.

ORNAMENTAL GARDENING.

INTRODUCTION.

Ornamental gardening may be divided into three kinds; 1. Parterre or flower gardening; 2. Botanic gardening; and, 3. Shrubbery gardening, or the culture of flowering shrubs. In a complete treatise these different heads should be discussed separately; here they need only be noticed together, and that in a very cursory manner. The object of this kind of gardening is chiefly ornament, taste, and amusement. To effect this purpose, we have materials of different natures to be selected, exhibited, arranged, disposed, or combined together. How custom proceeds in this matter may easily be learned; but what is truly proper can only be discovered by reflection, and recurrence to the principles of good taste; which are as universal in their application, as the sources from which they are

drawn, the mind of man, and the elementary modifications of matter are unlimited in the extent of their existence. It is scarcely necessary to observe here, that the operations of cultivation in this branch of gardening are performed after the same manner, and on the same principles, as in the former branch of it; the only difference being this, that here less gross culture (so to speak) is necessary; for as the productions of ornamental gardening address themselves chiefly to the mind, which being in this age and country more refined than the mere animal sensations, is consequently more capable of relishing the beauty and simplicity of nature. Some there are, however, so gross in taste, as to prefer tulips and Dutch flower roots to ericas and violets, and who are more delighted in a Dutch parterre than in Dovedale or Arthur's seat. This perverted taste can only be accounted for on the same principles, as some prefer a country covered with dirty ruinous cottages, and inhabited by gypsies and old starved peasants, to one where cleanliness, comfort, and cultivation, are the prevailing ideas. All extremes of this sort are unphilosophical, and totally opposite to the principles of true taste.—The remarks which I offer on this subject are arranged as follows: 1. Of the materials of ornamental gardening. 2. Of the principles of selection and arrangement. 3. Of the subjects of ornamental gardening.

CHAPTER I.

OF THE MATERIALS OF ORNAMENTAL GARDENING.

These are lawn, gravel, soil, water, stones, flowers, shrubs, and trees.

Lawn, or smooth turf, is a pleasing and extensively useful material, and in many of the subjects of ornamental gardening forms a conspicuous part. It is produced from grass seeds sown on poor soil, or by turf brought from old pastures. It is preserved and much improved by rolling and mowing, and greatly injured by worms, rich spots of soil, or manure. Walks are frequently made of lawn, which have a good effect in some ornamental scenes; but there should generally be others of gravel, to have recourse to when these are moist or unpleasant. In almost every case, where lawn is not fed by sheep, it should not be formed of mere grasses; which require continual mowing, and present one dull, vapid, surface of uniform green. They should be composed of primroses, violets, common and garden daisy, camomile, *graphallium*, *doicum*, *hieracium pilosella*, and especially white clover. Any three of these species, or the whole of them judiciously mixed, would form a varie-

gated carpet of gay flowers, from April to December, the effect of which, compared to mown lawn, would be as gaiety to gloom, or insipidity to expression—All the expence of mowing would be avoided, and all the smoothness necessary for lawn preserved, in connexion with such a variety of roughnesses as would give the whole a natural appearance. Lawns of this kind exist in nature, and have occupied the pastoral poet. The beauty they would add to artificial scenery is beyond description—the economy in yearly management by no means inconsiderable.

GRAVEL AND SAND are useful materials for walks and paths. As these are most generally used in mornings and evenings, when the grass is moist with dew, and also after rain, when it is a great luxury, unmolested by water or moisture, to observe the face of nature, they should always be made of a firm and dry material, and gravel is the best of this kind yet discovered. Gravel walks in parterres and ornamental gardens should generally be in free easy directions, and with neat determined outlines. But there are exceptions to the former remark in the case of parterres of bulbous roots, and those where particular shapes and figures are imitated.

SOIL is not only of use for growing several of the materials, but also by way of contrast and relieving them. Former ar-

tists, taking advantage of this effect, have introduced different coloured earths, which Lord Bacon justly reprobates as trifling. The natural soil throughout is always preferable, and if tastefully varied by the green of vegetation will have a very harmonious effect. Soil, with regard to its quality, should be poor for most ornamental plants and shrubs:—various but chiefly *dry virgin pasture loam* for most botanic plants:—mossy and moist for ericas and most American and Cape plants, &c.

Water is introduced in parterres, shrubberies, and botanic gardens, either in still ponds, drooping fountains, or jets-d'eau; but as they are all artificial, no perfect models can be held forth for imitation. Still, however, there are principles to which we can ever have recourse, either in judging of or contriving all works of art. Contrast, in every modification of matter, is capable of producing either incongruity, variety, or harmony, and consequently of effecting scenes which shall disgust, please, or highly interest, the spectator. The application of the principle of contrast to the formation of artificial ponds and jets-d'eau might be advantageously treated of at great length; but it would occupy more time than can be spared in this work; and is the less necessary for this reason, that to those who understand the principles of taste, which I have already endeavoured to lay down, it would be almost unnecessary; and to others it would not carry conviction unless

reduced to practice. Jets-d'eau are not so much condemned in this country as they were a few years ago; but they are less understood in most places. Where they have been introduced, as at Trentham, they are contemptible or misplaced.

Stones of singular shapes, or shells, &c. are used in parterre gardening, in collections of what is called rock-work, on which are inserted mountain plants. They are admissible in this way, and sometimes have a good effect, especially when they surround a pond in a parterre, as at King's Weston.

Flowering and botanic plants are the most extensively used materials. They may be divided into, 1. Bulbous rooted plants, far removed from their natural state; 2. Tender herbaceous plants; as pinks, auriculas, carnations, &c.; 3. Common herbaceous kinds; 4. Annual flowers; 5. Bog or moss plants; 6. Botanic plants, or such as are cultivated for botanical amusement. A few hints shall be offered on the culture of each of these divisions.

1. Bulbous rooted plants require very particular management; first to produce new varieties, and afterwards to preserve them. The varieties are produced chiefly from seed, and are improved, or *broken*, as florists term it, by the soil, &c. See Justice's Flower Garden, Maddox's Directory, &c.

2. Tender herbaceous plants. To these nearly the same remarks apply. They are better deserving of culture than the other, because less monstrous. Pinks, carnations, auriculas, and polyanthuses, are singularly fine flowers in the eyes even of the botanist.

3. Common herbaceous plants are easily propagated and cultivated. They will grow in most soils, and are so various in magnitude, form, mode of growth, time of flowering, colour of the flower, &c. as to suit themselves to every situation which can occur in those parts of a place devoted to ornamental gardening. With respect to magnitude, some grow very large, as the solidago*, rhubarb, &c.; others very small, as the common thyme, daisy, &c. There is every variation between these two extremes, as in the *primula*, *dianthus*, *cherianthus*, *valeriana*, *vicia*, &c. There are frequently all the varieties of magnitude in one genus, as in *aster*, *cardus*, &c.; often most species of a genus are very large, as the *rudbeckia;* and frequently they are very small, as the *bellis* and the *hepatica.* With respect to form, some plants, when disengaged from others, assume a regular conical shape, as the common larkspur; others an inverted cone, as most asters, and plants bearing their flowers in a corymbus.

* It is unnecessary to mention the particular species of those to which these characteristic distinctions are applied, as they will occur at once to every person in the least acquainted with plants.

Some form a broad, flat, and apparently solid mass upon the surface, as the *cerastium*, *saxifraga*, &c.; others a more loose, but still a broad mass, as the *trollius*, *convalaria*, *primula*, &c. From this solid mass some send out high flower stems, as the *asphodelus;* and others conceal these among the flowers, as the *epidendron*. With respect to *modes of growth*, some send out branches from a principal stem like a tree, as the *cardus;* others send all their stems from the root, as the *mentha*, &c. There is a medium between these two extremes in the *astrantia;* and both modes are united in the *scandex*. Some plants always creep upon the surface, as the *ajuga;* some constantly attach themselves to others by tendrils, as the *pisum;* some again attach themselves by twining round other bodies, as the *convolvulus*, &c. With respect to the flowers of plants, their form, colour, and time of flowering, are endless; and no discrimination either in the characteristics of general form, or of the flowers, can be of much use to those who are not botanically and practically acquainted with them. Such will find their memory refreshed by the occasional use of Don's *Hortus Cantabrigiensis*, and Stillingfleet's Catalogue of Flora.

4. Annual flowers are equally various with such as are herbaceous or perennial. Their culture is well known. They are highly beautiful, and peculiarly adapted for parterres or flower gardens, as being removed every year.

5. Bog or moss plants and shrubs are a highly beautiful class, requiring a particular soil, situation, and mode of culture: hence, in ornamental gardening, they ought generally to be placed by themselves, particularly the more rare kinds of them, as the American and Cape tribes. The *soil* in which these commonly grow best is a sandy moss of moderate moisture; the *situation* low and well sheltered; the *exposure* generally to the south, though many species will thrive well under the shades of other trees, or exposed to the north. This is strikingly exemplified in the beautiful undergrowths of rhododendrons and arbutus at Kenwood and Mount Edgecumbe, also in the large American plants at Zion House, Croome, and several other places. Exotic bog and moss plants, as *ericas*, *diosmas*, &c.; and indeed all exotics, though kept in green-houses most part of the year, should always be in a northern exposure when placed in the open air, as is customary during the summer months. This cool and sunless summer will make their winter in the green-house, comparatively with what it would otherwise be, light and agreeable.

6. Botanic plants and trees. This division includes all those not comprehended in the former. The word plants is here taken in its most extensive or general sense for all vegetables, excepting trees and shrubs; consequently all of these are included from *monandria* to *palmæ*. Their natural soils, situations, &c. are

almost as various as their names; but upon the whole the following kinds of soils and situations will grow most of them in a botanic garden: 1. Virgin mountain earth dry; 2. Mossy earth in a moist situation; 3. Half of each in a moist situation; 4. Half of each dry; 5. Moist clay and moss; 6. Dry gravel and sand; 7. A running brook, with a clear gravelly or sandy bottom; 8. A stagnate brook or pond, with a muddy bottom; 9. A rock work, with the stones large, and joined as close as in causewaying or building, but without mortar; built in the form of an irregular pyramid or cone, on all sides of which certain species of mosses, ferns, &c. could be grown; 10. Trees alive and full grown, and also decayed for the growth of mosses and funguses; 11. Part of the sea-shore, of which to form proper places for most sorts of sea-plants; 12. Hot-houses, &c. for exotics. This includes the chief requisites of a complete botanic garden; but 1, 2 and 8 will nearly serve the purposes of all the rest (excepting sea-plants) under the management of a judicious gardener.

Shrubs form a class of materials no less interesting than flowers. They require less care in cultivation, and their beauties, consisting chiefly in the general form and appearance, are less fleeting with the seasons, and more striking at a distance. They may be divided into *evergreens* and *deciduous* kinds; and each of these divisions into such sorts as are *rarely seen*, and

such as are *generally cultivated*. *Evergreens* may be formed into many sub-divisions, according to their magnitude, forms, mode of growth, colour, &c. which are of every shade between the *ruscus*, which is among the least, and the Bermudian juniper, which is nearly the largest—the cypress, which grows in the form of a *spire*, to the *daphne tarton raira*, which forms a globular tuft upon the surface—the *hedera*, which fastens itself to the wall, to the *andromeda*, or *vinca*, which recline themselves upon the surface—from the holly slightly tinged with red, to the box of a golden yellow.

The *deciduous* sorts are capable of the same sub-division, and are diversified in each of these particulars. Here they may be divided into such as are cultivated chiefly for the beauty of their flowers, as the rhododendron, erica, &c.—for the smell, as the sweet briar, *absinthides*, *cleriodendron*, *jasminum*, &c.—for both, as the rose, Cape jasmine, &c. Others are cultivated chiefly for the beauty of the leaves, as the *acuba*, variegated holly, &c.—others for the fruit, as the *mespilus pyracantha* and the orange; others for the beauty of the whole plant, as the *aristotelia*, &c. but most for all of these properties together, as the myrtle, *lauristinus*, laurel, &c.

Trees form the last natural material in ornamental gardening; and though the use of them more properly belongs to the

subject of planting, or picturesque improvement, yet they deserve to be noticed here, because a few of them are occasionally introduced into parterres or botanic gardens, either for their individual *beauty*, for *shelter*, *shade*, or some of the uses of picturesque improvement. It is in the shrubbery, or those parts of the pleasure grounds which contain flowers, shrubs, and TREES—which occupy considerable space, exhibit views of the country, or of other parts of the ground, that ornamental gardening and picturesque improvement blend themselves together.

STATUES, URNS, INSCRIPTIONS, BUSTS, MONUMENTS, &c. are materials which should be introduced with caution. None of the others require so much taste and judgment to manage them with propriety. The introduction of *statues**, except among works of the most artificial kind, such as fine architecture, is seldom or never allowable; for when they obtrude

* Perhaps there is no other mechanical effort of art so preposterous as *naked* bronze-coloured human figures exposed in the open air, and surmounted with lumps of *snow* or *ice*. Decency and common sense equally loathe them, and good taste flees their presence. As an apology for such insupportable absurdities, it is alleged that they are of Grecian origin. This is an error: it is true, the Greeks, despairing of being able to execute figures with drapery, produced naked statues; but these were always placed within their temples. The *exposure* of nakedness is a comparatively modern corruption of the true Grecian taste, which ought not to be thus abused. The Romans and modern Italians are the authors of this vulgar practice. In every case (except bathing scenes, which are properly *private*, and consequently unfit for *public* representation) the introduction of nudity, whether in painting or sculpture, betrays bad taste and want of talents in the artist.

themselves among natural beauties, they always disturb the train of ideas which ought to be excited in the mind, and generally destroy the character of the scenery. In the same way, busts, urns, monuments, &c. in flower gardens, are quite misplaced; as any unprejudiced person, capable of attending to his own mind, may *feel* in the flower garden at Nuneham, and as reason and judgment may convince any one who understands the principles of taste. The obvious intention of these appendages is, to recal to mind the virtues, qualities, or actions, of those for whom they were erected: now this requires time, seclusion, and undisturbed attention, which must either render all the flowers and other decorations of the ornamental garden of no effect; or, if they have effect, it can only be to interrupt the train of ideas excited by the other. As the garden, and the productions of nature, are what are intended to interest the spectator, it is plain that the others should not be introduced. This reasoning, while on the one hand it shews the absurdity of such a practice, on the other directs that urns, monuments, &c. should only be placed in solitary unfrequented places, where the mind is naturally led to contemplate, and where the remembrance of the virtues of great men, or the worth of relations now no more, afford proper subjects of contemplation.—But even in places apparently solitary, or secluded, these have been introduced in so affected or improper a manner, as to furnish reason for the greatest caution in future.

When, on viewing sublime productions of architecture, the mind is rapt in wonder, astonishment, or awe, *statues* often come in well, and increase and prolong the emotion; as in contemplating the west front of St. Paul's Cathedral, York Minster, or Westminster Abbey; but they can seldom raise the emotion of sublimity when they become principal in any composition of architecture; as when they are employed as columns or for other useful purposes, as in the order of caryatides*; and of scenery, as when they are used among trees, flowers, or shrubbery. If placed among scenery to be admired as works of art—as fine pieces of sculpture, they will never sufficiently interest any but such contracted connoisseurs as would not enjoy the other objects, and would much distract the attention of men of true taste. Witness the bad effect of the very excellent statues placed near to, and in, the greenhouse at Shuckborough.

Inscriptions, merely as such, are in general despicable resources, and only indicate conceit and want of *mind*. If the inscription be apposite, we are much better pleased to feel or recollect the coincidence on reading than to be told it by others; if it be foreign, or *far fetched*, it argues a gross defect in those who placed it there, and serves to excite ridicule; if it be

* This is exemplified in Liverpool Exchange.

merely a whim or fancy, as where an urn or seat in a pleasure ground exhibits in large letters "To all friends round the Wrekin," it is disgusting.

Buildings, being more conspicuous than either statues, urns, or inscriptions, require to be introduced more sparingly, and with greater caution. In mere garden or ornamented scenery, they should seldom obtrude themselves by their magnitude or glaring colour; and they should rarely be erected but for some obvious purpose of utility. The chief use of such buildings will be as covered seats, arches, or gateways, or hothouses; other larger and more conspicuous buildings are treated of under picturesque improvement, or the conveniences of a residence.

Covered seats are introduced of many forms, and under a great variety of names, such as root-houses, heath-houses, moss-houses, huts, bowers, caverns, caves, grottos, temples, mosques, &c. besides plain covered seats either of wood or stone. The imitation of temples or mosques, as they must generally be on a small scale, is quite ridiculous. The propriety of introducing the others depends entirely upon the character of the scene. Light bowers formed of lattice-work, and covered with climbers, are in general most suitable to parterres; grottoes to American gardens, or aquatic scenes; plain covered seats suit

the general walks of the pleasure ground. Most of the others may be introduced in romantic, singular, wild, or melancholy places.

Arches or gateways in the scenery of the pleasure ground, besides their utility when properly placed, are often picturesque improvements, both by giving more *force* and strength of effect to mere earth and vegetation; and also by occasionally producing the charm of surprise, which, when unaffectedly introduced, is sufficiently allowable. Thus in the transition from one scene to another, an archway and close gate or door between them is often necessary to complete the purpose of the separation fence: now, though there be no difference in the kind of scenery on each side, yet on approaching the gate from either, the extent of vision is gradually diminished, from considerable width, length, and height, to the mere size of the gateway; which, when opened the full extent, bursts upon the sight at once. Quick and angular turns of walks have a similar effect, and may often be advantageously introduced.

Hot-houses, in ornamental gardening, are chiefly of the greenhouse or conservatory kind, and are more properly objects of use than external beauty, though this also ought to be attended to. They will naturally be considered in Chapter III.

CHAPTER II.

OF THE PRINCIPLES OF SELECTION AND ARRANGEMENT IN ORNAMENTAL GARDENING.

The object of ornamental gardening is to exhibit beauties, either *singly* or *collectively*. The first and most obvious purpose of selecting *single* objects is to shew minute beauties, such as flowers, or fruits. This is done by placing the plants or shrubs which produce them in the most conspicuous situations, either on lawn, pulverized earth, or in pots. The next thing which would naturally strike gardeners in selecting beauties from wild nature would be, to collect a number of them together; this would be first done in rows, and afterwards in beds or masses of various forms and dimensions. Originally, symmetry and regularity would be studied, as first perceived beauties; but in time, as parterres or flower gardens of this sort became more general, fancy would be exercised to produce novelty and variety, and excite wonder and curiosity. Hence the origin of fashion or style in this kind of gardening, both with regard to different countries, and the same country at different periods. To pursue the subject farther, however, in an historical way, would not afford much instruction with regard to *principles;*

and I shall therefore observe, that *the selection of single objects*, which may be called the lowest principle of ornamental gardening, may either refer to trees, shrubs, or plants; and of these, either to the leaves, flowers, fruits, or to all of them together.

The next purpose of ornamental gardening is, to shew beauties *collectively*. This is accomplished either by ARRANGEMENT or GROUPING.

ARRANGEMENT may either be effected upon the principles of botany, of culture, of general nature, or artificial borderings. *Botanical arrangement* may be as various as the different systems which have been invented by botanists, whether natural or artificial. This mode of arrangement is employed in botanic gardens, or collections either of plants or trees. Arrangement according to *culture* refers chiefly to such plants or trees as require a particular attention with regard to soil, climate, &c. Thus all the bulbous-rooted flowers, tender herbaceous plants, American plants and trees, and in some instances exotics, are arranged according to this mode; and particularly the first class, which are always, when in a cultivated state, guided by it, as in Dutch parterres, &c. *The arrangement universal in nature* is what will be most pleasing to general admirers. Its principles are perfectly simple; being nothing more than this,

"that one kind of objects, beauties, or characters, always prevails in one place; and that when another succeeds, it is generally done in a gradual manner, the interval between them being composed of characters or beauties irregularly blended together." This is beautifully illustrated throughout all nature, whether animal, vegetable, or mineral. It may be observed, as I shall afterwards shew*, in the trees of natural forests, no less than in the grasses and mosses which form a carpet upon the surface; and is intimately connected with a similar arrangement which takes place in the soil, both with regard to quality, variation of surface, and moisture. It is equally observable in the animal creation, from the several varieties of man which inhabit different quarters of the globe, to the numerous species of insects or reptiles, which have each their particular *habitats* in plants or trees, or particular kinds of surfaces and local climates. It has hitherto been totally neglected, as most of nature's laws have been in this branch of science; while in its place is substituted, by custom and ignorance, a mode of arrangement totally inconsistent with nature or good taste; I mean the vulgar mode of mixing different species together indiscriminately; not only without the smallest regard to connexion or difference of character, but in studied opposition to it. Thus, in green-houses, the common rule is, never

* See PLANTING.

to let two species be placed close together, but to distribute each species equally throughout every part of the house. The same rule is applied to flower gardens, shrubberies, and planting in general; but any one capable of reflecting on the subject will perceive, that it is as opposite to the principles of good taste, and as destitute of connexion, variety, or character, as the order of words in a dictionary is to that of common conversation, or the arrangement of colours on a painter's pallet-board is to that of the rainbow.

This principle of arrangement is the most generally applicable in ornamental gardening, whether we regard their general distribution into lawn, flower, and shrubs; or the smaller parts, composed of flowers or shrubs only. Even a collection of beauties, exhibited singly, may still be contrived agreeable to this principle. Thus in a plot of finely varied auriculas each minute variety may be kept by itself, and the same often (though not always) in beds of tulips, hyacinths, and ranunculuses. *Artificial borderings*, that is, flower borders along the walks in gardens, or borders of flowers in papered rooms, or indeed ornamental wreaths or borders of any kind, are formed upon the principles of *contrast* and *repetition*. A small part of that border, of a length more or less according with its breadth, and the variety to be contained in it, is first formed by placing together flowers of different forms and colours, so as to set off

one another to the greatest advantage, and thus form either a varied or harmonious combination;—then the same thing is repeated, generally without any variation*, ever afterwards, which forms a continued series of the same harmonies. This mode of arrangement is chiefly applicable to flower borders that are carried along the walks of common kitchen gardens. It is well practised by most gardeners, not only in planting the roses or shrubs which they distribute regularly throughout the whole, but also in placing the perennial plants; and in spring, in sowing the annuals, it is done in a most minute and accurate manner. In some species of flower gardens, as in the culture of tulips or other similar flowers, it may be applicable; but it is too trifling for being generally employed, and ought never to appear in shrubberies, or any sort of extensive works. Being of a simple nature, and easily comprehended by most gardeners, it has given rise, and is in fact nearly allied, to the erroneous arrangement reprobated under the preceding head:—an arrangement which has been followed, as far as can be known, from the earliest ages; but which is not on that account to be continued, when founded, as I trust I have satisfactorily shewn, upon no just principles.

* In some Egyptian and Grecian borders of ornaments, perpetual variations have been made, but not with a good effect; of which the unfrequency of the practice may be a sufficient proof.

GROUPING has been explained under Painting. It effects variety, intricacy, and harmony, and may be applied either to objects of the same kind in which the chief principle is contrast of the parts, or to objects of different kinds in which the chief principle is disposition or contrast of different objects. It is applicable to all the larger scenes of ornamental gardening, in connexion with all the natural principles of arrangement, except *culture* and *bordering*, where it would cause much inconvenience in pulverizing the soil. Even there, however, it may frequently be introduced with advantage and effect; but considerable judgment is requisite, to decide when ornamental effect should give way to convenient culture. In shrubberies, and scattered trees or shrubs, either alone or seen in connexion with any of the other materials of ornamental gardening, grouping is an indispensable requisite, and can never be omitted without foregoing one of the greatest beauties in nature; one which is universally prevalent in every variety of natural scenery, which is instantly perceived, and so highly fascinating to the man of taste, that no other beauty whatever can compensate for its absence. It will be at once perceived, that the beauty I mean is *connexion*; which, according to the objects connected, may either produce order, variety, intricacy, or harmony. Unfortunately, however, it is a beauty not much, if at all, perceived by gardeners, and is rather adverse to the principles of *cultivation*, and that love of *offspring* inherent in

the mind, which makes a gardener so fond of the trees that he has reared, as either to use every means to keep them isolated from one another, so as they may properly enjoy all the agents of vegetation, and become conspicuous single objects; or else, from want of courage to extirpate individuals, to let the whole grow up together until they destroy each other. The principles of natural effects, however, are universal in their application, even with regard to utility. These principles, and also the imitation of the effects produced by the extremes of their operation, will ever be the true criterion of beauty* in the arts of taste, or in ornamental productions.

* This is equally true, both of the physical and moral world,—of men and things; variety and unity are attributes of perfection.

CHAPTER III.

OF THE SUBJECTS OF ORNAMENTAL GARDENING.

These are, Parterres of different kinds; Botanic Gardens; Hot-houses; Conservatories, &c. Small Groups of Shrubs and Flowers placed upon Lawn; Shrubberies, and Pleasure-grounds.

1. Parterres.—The form, extent, and kinds of these are various, from the general flower-garden to be met with in several places of England, as at Nuneham, Beaumont Hall, &c. to the remains of the antient French parterre, containing the arms of the family cut out in box, divisions of sand and shell work, and trees shaped into men and animals, as at Wentworth Castle and Levens Park*.

In *ornamental* gardens or parterres of every kind, the soil should be unmanured, and rather poor than otherwise; but the situation and exposure should be good, and the surface of the ground beautifully varied. Their extent must be in propor-

* Laid out by King James the VIth's Gardener.

tion to the place to which they belong. In general, they need not be large. In almost every kind, a few trees and shrubs should be introduced, to remove from the general view the appearance of insipidity, and to break it into separate scenes; one of which alone should be seen at a time, that the extent of vision being circumscribed the spectator may thus be induced to examine or admire the minute beauties of single objects or small compositions. I may observe here, that where parterres are intermingled with lawn, those disgusting lines of separation at the edges of walks, or round groups and dug patches of flowers or shrubs, which abound every where, should not be introduced; the gravel of the walk, and the earth at the edges of the dug patches or groups, ought to be kept nearly on a level with the grass on the lawn. Where much culture is requisite in the groups, the line of separation should be delicate and graceful; and where this is not necessary, or not much attended to, both the lines of the walk and the lines of the dug group or patch should blend and harmonize, and, in a natural, easy manner, glide insensibly into each other.—A few of the most remarkable varieties of parterres shall be characterized below.

1. A *general* flower-garden, or parterre, should contain such a variety of beautiful trees, shrubs, flowers, &c. as that a number of each will be in perfection every month of the year, particu-

larly in the summer season. They should be placed in irregular groups and thickets, of different sizes, gliding into one another on smooth lawn, beautifully varied, and broken into small, confined scenes, by trees and shrubs of the most elegant sorts. Throughout the whole, smooth gravel walks should wind in a graceful, easy manner. In such a garden, the green-house and stoves for exotic plants and trees may be placed. In summer, those which are reared in the green-house may be dispersed throughout the garden; and the pots being sunk in the earth, the plants will appear as natives; or they may be arranged in a situation by themselves, and retain their own character; and, during this season, the house may be filled with balsams, coxcombs, amaranths, and other tender annuals. A few elegant seats, both covered and uncovered, may be introduced; but no grottoes, urns, busts, nor temples; which have all their proper places in ornamental scenery, but which, as I have formerly remarked, are unsuitable to this scene.

2. *A winter garden* should contain such trees, shrubs, plants, &c. as are in perfection, or retain their verdure, during this season; such as most of the evergreen tribe; and several flowering plants, as aconite, Christmas-rose, &c. They should be *grouped* and *arranged* in the *natural* manner, and a dry

gravel walk should be conducted throughout the whole. This garden should be situated near the mansion, in order that it may be conveniently and comfortably approached in the winter months. In it the conservatory should be placed.

3. *A spring garden* should contain all those deciduous shrubs and trees which blossom or put forth leaves the most early in the spring, such as the almond, mezerion, fringe tree, &c. &c. All the early-blowing flowers, both of the bulbous and fibrous-rooted kinds, as the narcissus, crocus, iris, cowslip, auricula, hepatica, &c. The walks should be of gravel, and little or no lawn should appear.

This garden may contain a house for heaths, auriculas, and other early-flowering plants. It should be placed near the former one, and connected with it and the mansion by a comfortable gravel walk, that they may be approached at any season. The soils of both should be light and dry, the situations well exposed to the sun, and sheltered from the northern blast.

4. *An autumn garden* should contain such a collection of ornamental plants and trees as are in perfection at this season; such as most annual flowers when late sown; many herbaceous plants, as *aster*, *solidago*, &c.; and several trees and shrubs

that continue long in perfection, as the honeysuckle, *rose acacia*, &c.

5. *A parterre of bulbous roots* requires to be somewhat different, in form and design, from any of the above. The general form ought to be regular. It may be a square, a circle, or oval, divided into compartments, and each of these laid out into beds of three or four feet broad. Here may be grown the different varieties of tulips, hyacinths, ranunculuses, anemonies, &c. each in their proper soil*. It may contain a stove for the *Ixias Amaryllis*, and similar exotic bulbs; and near it may be placed the auricula and carnation shed.

6. *Gardens* may also be made solely for the purpose of cultivating any single family, genus, or species of plant or shrub, as a garden of *roses*—of *annual flowers*—of *pinks* and *carnations*—of *double flowering plants and trees*—of *variegated kinds only*, &c.:—or of *ferns*—of *grasses*—or of *the vegetables, natives of any particular country*, as those of *America*, *Siberia*, *the Alps*, &c.

7. *An ancient British flower-garden* may be laid out agree-

* See Maddox's Florist's Directory.

ably to the directions of Meagre's Designs, Hyll's Art of Gardening, published 1596, and Switzer's Gentleman's Recreations.

8. *Modern British flower-gardens* are of two kinds; 1. Those laid out into beds fringed on the edge with box, pink, or gentian, &c. as at Blenheim, Raith, and most places; or, 2. Those laid out into patches and clumps on lawn, as at Nuneham, Beaumont Hall, Eglinton, Colzean Castle, &c.

9. *A Chinese garden*, if desirable, may be formed from the hints in Chambers's Dissertation on Oriental Gardening.

10. *A Grecian garden.* See Moore's Letters, Ælian's Various History, Athenæus, &c.

11. *Roman and Italian gardens.* See Cato *De Re Rustica*, Virgil, Pliny's Epistles, &c.

12. *A Dutch garden.* See Haveneer Konst, by Johann Herman Knoop, published 1753.

13. *French parterres and gardens.* See Quintinius, James, &c.

These scenes are not only pleasing or amusing in themselves, but, when introduced in a pleasure-ground, by their contrast with other scenes, and with one another, may add to the variety and interest of that species of ornamental scenery.

A SMALL BOTANIC GARDEN, OR BOTANIC PARTERRE, may contain a large collection of all, or several, of the different families of vegetables, as an *arboretum*, *frútecetum*, *harbarium*, arranged either by the sexual or the natural systems of Linnæus, or by the natural system of Jussieu, or any other author. These may be planted either in beds, as is commonly done when the Linnæan system is followed, or in irregular masses when any natural arrangement is adopted. A university botanic garden does not come within the plan of this work.—See Chapter I.

HOT-HOUSES, in ornamental gardening, are of various kinds, characterized by the modes in which the plants are grown, and the different degrees of temperature employed in their culture. The principles of their formation and management are the same with those already mentioned under USEFUL GARDENING, and therefore do not require to be repeated here: all that is necessary is, to offer a few hints on the different varieties required for ornamental purposes; these are, Stoves, Greenhouses, and Conservatories.

Stoves are of two kinds; dry stoves, in which the plants are grown in pots without being plunged in beds of earth or bark; and moist or pit stoves, in which the plants cultivated are chiefly grown in pits; or, beds of earth, or bark, the individuals commonly inserted in pots, but sometimes merely inserted in the soil. Dry stoves are kept of a temperature in general between 55 and 70 degrees; and moist stoves between 65 and 90 degrees. The most economical form is a parallelogram, placed from east to west, of glass sashes on the south side, roof, and ends, and masonry toward the north; but the most elegant and eligible for the plants is one placed north and south, and of glass on all sides. Unless an inner roofing is used, however, glass on all sides is precarious, especially in the northern parts of this island. Where the plants are grown in pots and plunged in earth or bark, the pits are made of considerable depth to admit of those materials, as in the culture of pines; but pits filled with earth, and treated in the manner proposed by me for growing the pine, are at first sight so decidedly preferable, both with regard to beauty and economy, that no unprejudiced person, who understands the plan proposed, will reject it for *stove plants*, though he might even reckon it unfit for growing pines.

Green-houses.—To the general form of these the above remarks are equally applicable; and the particulars of their

tioned. They ought to be made of different dimensions, according to the kind of exotics to be cultivated. In disposing the plants in the house, besides the general principles mentioned in the preceding chapter, regard should be had to the placing of minute beauties together, and as near the eye as is consistent with elegance. *Geraniums*, *myrtles*, *hydrangias*, should never interfere with *ericas*, *brunias*, or *diosmas*, nor should either be mixed with *ixias*, *oxalis*, or *cyclamen*, &c. A green-house may generally appear as an object in the flower-garden, but should always be well blended with vegetation. What will contribute to this, and greatly heighten effect in entering it, is a small porch or archway of lattice-work, continued a few yards from each door. The spectator, on entering the green-house after passing through this confined and shady passage, will conceive it much loftier than it really is; for now the mind, in place of having a tendency to compare it with the open air, will compare it with the low dark passage of the porch. Moveable green-houses, as at Nuneham, where the plants during summer are exposed on all sides to the sun, wind, and rain, are very agreeable, and may easily be contrived. A large orangerie after this plan would have an excellent effect in a *regular* flower-garden. That at Nuneham is too formal and confined for its situation, which is among beautifully varied ground, winding walks, and numerous groups; and is particularly discordant with the large trees which surround this garden, and

materially injure it, by being so near its boundary, both in respect to culture and effect.

Conservatories.—These are kept of various temperatures, between that of the dry stove and the open air. They may be constructed of any form, and placed either in a parterre, or adjoining to, and connected with, the mansion. In them may be grown all kinds of green-house or dry stove plants, and frequently fruit trees intermingled with them. In the Treatise on Hot-houses, I have shewn a great variety of ways in which conservatories or green-houses may be heated from the fires requisite for the house. I shall therefore not repeat any of them here, but refer to Plate XII. fig. 1., which is a plan of a house with a large conservatory and vinery, designed by me for a small place in the immediate neighbourhood of London, where no prospect, or good external views, can be obtained from the windows. The vinery is heated by the fires of the kitchens, and a small dressing or book-room. The conservatory by those of the drawing-room, library, and dining-room. From all these three rooms agreeable perspectives through the conservatory may be obtained, even while sitting at table; as the dotted lines in the plan serve to shew*. In those parts of the conservatory farthest from the

* The central part of the principal building is intended to be carried up a considerable height, as a tower; the rest is to be two stories high, with parapets all round, of such a height as to conceal the chimnies. As few windows as possible are

fire places, the hardiest green-house plants may be grown; and in those nearest them, succulents, and even dry stove plants, will thrive. Vines may also be trained up a few of the rafters, and ornamental creepers or climbers on the rest. Standard peaches, cherries, figs, &c. may be grown; which, besides their gay effect in spring, and the beauty of their fruits, which are always most numerous on these trees when grown as standards, communicate also an umbrose appearance which is a great acquisition to a conservatory. When these trees become of too great magnitude, and when myrtles, mimosas, and other exotics, are large enough to supply their place, they may then be taken out or removed. And if a little fruit be still wanted, some of these trees in pots can easily be introduced in spring, and taken out as soon as the fruit is gathered. By paving the bottom of the pits or beds in this conservatory, and placing above the pavement a stratum of gravel six inches in thickness, and above that three inches of *green* moss, and then the soil, the whole house, except the plants in pots (and these ought to be few), may be

to be shewn; those of all the bed-rooms on the south side being to come down to the floor, and looking entirely into the conservatory, which will also derive heat from their fire-places. The bed-rooms and dining-rooms may be wholly heated at any time by opening the windows and admitting the air of the conservatory. The greater part of the house externally is to be covered with ivy and other creepers, which will give the whole a singular and romantic appearance, and distinguish it from the tasteless cottages and villas which abound every where in the neighbourhood of London, the productions of meagre fancy or whimsical novelty.

watered in two minutes by pouring in water to this stratum by a convenient tube contrived on purpose. It may be thought, as some plants require less water than others, that thereby they would be injured ; but this can easily be prevented by placing such plants in a porous and non-retentive soil, by which means they will absorb no more than what is necessary and proper; at the same time any plants that may require an extraordinary quantity ought to be put in a retentive soil, and may further have a little water given to them upon the surface ; for this mode is not meant to supersede surface waterings entirely, except in winter, when that practice generates damps. It is evident, that a glass house of this kind, (heated by fires which at any rate require to be kept up,) with a *porous substrata* and *inner roofing*, could be managed with very little trouble or expence. And as a conservatory is one of the greatest luxuries both to a principal residence in the country, and a small villa or cottage near town, perhaps it may tend to promote their more general introduction.

Fig. 2. In this plate is a section that shews the exact manner in which the heat is obtained from the kitchen fire-place : *a a* is a wall of masonry; *b b* two carron plates; *c c c* the passage for the air; which by being thus confined easily becomes heated, and passes out by the holes in the board *d*, which serve to diverge it regularly, and prevent any plants from being scorched by it.

By pouring water upon the plate *e*, abundance of steam may be produced, when requisite for the vines. The same kind of plan is applicable to the fire-places of the family apartments, only with a little more elegance in the curvature of the carron plate next the room, &c.

Small groups of shrubs and flowers, when placed upon a lawn, should always be of very irregular shape; when upon gravel, this must depend upon circumstances. If in a part where art is avowed and ought to prevail, then the more artificial the form, so much the better; but if merely a group for dividing or varying a road, walk, or natural path at a distance from artificial scenes, then it should be as irregular as those upon the lawn. In almost every case, whether these groups are made regular, or irregular, they require to be cultivated for some years afterwards. This, according to the present mode of digging them, produces a harsh and disagreeable boundary line; and the chief improvement which I propose in this branch of ornamental gardening, independently of arrangement, grouping, and connexion, which have been already treated of, is to destroy as much as possible this line of separation. Nothing can be easier done; it being only requisite to keep the earth on the margin of the group of the same level as the lawn or pasture, and to let both blend harmoniously together. As all groups of this kind are only dug during a certain time; that

is, until the shrubs are so large as to render culture unnecessary; the pasture ought to be allowed gradually to encroach among the shrubs and flowers, until at last it wholly cover the surface. After this, the group becomes rough and picturesque; the flowers still continuing to grow among the shrubs will produce exactly what we see in natural groups; with this elegant difference, that in place of nettles, thistles, and such gross weeds, which however are as good to the painter as the finest flowers, we shall have narcissus, saxifrage, saponaria, &c. which will be quite in character with the rest of the pleasure-ground, and thrive well among pasture. In planting the shrubs in these groups, the great art is to put them in irregularly; for though the outline of the ground to be cultivated must, even under the best taste, be somewhat formal, yet the shrubs can always be planted as irregularly as if no outline or form of group existed. This, however, is a thing never done; for whatever be the form of the ground which is to be dug, the shrubs are regularly distributed over every part of it:—even when digging is no longer attended to, still none of the shrubs are thinned out, but the whole left a formal, unconnected clump of vegetation; an appearance as different from the irregular group thickets of nature, as a green hillock is from a rocky precipice. Groups, or rather masses of formal shapes, such as ovals in front of small villas, or basket-work patches upon lawn

in front of a mansion, must always have determinate outlines; because, being devoted chiefly to tender flowers and flowering shrubs, they will always require to be cultivated. Their outlines may either be formed of elegant masonry, wood, basket-work; or flowers, as thrift, daisy, &c. or often a broad margin of turf, when surrounded by gravel. The general form of these masses may be oval, circular, pentagonal, or fanciful, according to pleasure; and their surface may either be kept level with the lawn, or gradually raised from the margin to the centre. But it may be observed, when raised in this way, that the sides ought always to present a concave slope and not a convex one, as they commonly do, and which has a very bad effect in the public squares of London*. Basket groups often have a very *pretty* effect when covered with moss, as may be seen at Dalkeith. Others unconnected among themselves, and of shapes rather unsuitable to the situation, may be seen at Donnington. Though much has been said on the connexion of groups in the preceding chapter, I must repeat that neither those of irregular nor of regular shapes ought ever to be placed but where they have a proper relation and union with what surrounds them.

* See some farther remarks by the author on this subject, in the Literary Journal for January 1804.

Shrubberies.—This term is properly applied to a narrow belt or strip of shrubs and flowers, which is sometimes the chief ornament of a small seat. The idea of such a thing is good; and, if executed according to the principles of nature and good taste, it would produce an effect both interesting and pleasing. But as the reverse has constantly been the case, Mr. Knight justly reprobates their tawdry insipidity *. They are generally made for the sake of obtaining a walk, which may either conduct to some particular place or scene, as the kitchen garden, farm, wood, &c. or it may lead merely through the shrubbery for its own sake, and such views of external objects as can be obtained from it, or as deserve attention. This being kept in view in designing and forming shrubberies, these three things require particular attention: First, the arrangement and grouping of the trees, which ought to be that of general nature. Secondly, the intermixture of glades and pasture, which in most cases is an essential requisite. Thirdly, the judicious introduction of views of more distant scenery; which is most frequently desirable, unless in such parts as, by way of contrast, are preserved in umbrosity. This and the former requisites are naturally connected with picturesque improvements, the general principles of which are blended with this branch of ornamental gardening.

* "Curse on the shrubbery's insipid scenes," &c.

THE PLEASURE GROUND is a term applied to that part of the grounds near a mansion which is devoted chiefly to ornamental purposes. Many of the separate scenes of which it is composed relate to those subjects of gardening which have been already mentioned; but very frequently scenes formed almost entirely upon the principles of picturesque improvement are also introduced, and are always most interesting; such as lakes, rills, &c. Sometimes a number of the conveniencies of a residence are also included, as the dairy, apiary, &c. The general principles which demand attention in arranging these scenes are, convenience, connection, particular expression, and picturesque effect.

END OF VOL. I.

Barnbarrow, The Seat of Robt. Sams Agnew, Esq.r laid out by a modern Landscape Gardener as it appeard in 1805.

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Loudon del. Geddes sc.

Barnbarrow: The seat of Rob.t Vans Agnew Esq.r as it will appear when the alterations at present executing have been three years completed.

To Rob.t Vans Agnew, Esq.r this Plate with the other Views of his residence are respectfully inscribed by his devoted servant J. Loudon.

Published 2 May 1808, by Longman, Hurst, Rees, & Orme, Paternoster Row.

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